

COMPUTERWORLD

Win 95, NT compatibility awaits '96 reality check

By Cheryl Gerber

Users and developers hoping to run the same application under both Windows NT and Windows 95 will have to wait longer than they expected. The reality is that an identical "look and feel" won't exist until next year for Microsoft Corp.'s 32-bit operating systems.

As a result, developers and users must maintain two versions of software for Windows 95 and NT until Microsoft releases its Explorer Shell. This shell is the

Windows 95 graphical user interface for NT. Without it, NT has a Windows 3.1 interface, while Windows 95 has the new, Macintosh-like look and feel.

32-bit operating systems

Microsoft had declined to give a date for the release of the shell until a keynote address last week at the Windows Solutions conference in San Francisco. "The user interface will be on NT early next year," said Bob McDowell, vice president of Microsoft's enterprise customer unit.

Yet the wait for 32-bit application code
Win 95, page 119

Spectrum stalls

Cabletron admits database, distributed functions will delay rollout of network management platform

By Patrick Dryden

The much-anticipated new version of Cabletron Systems, Inc.'s Spectrum network management platform will be delayed several months, company officials confirmed last week. The delays stem from significant changes to the database structure and other key distributed functions.

Some Spectrum users involved in beta-testing portions of the software had hoped to get new features into operation before the end of the year.

Version 4.0 targets the needs of large networks by enabling peer communications and application sharing among Spectrum servers [CW, July 31]. Central administrators will then be able to run enterprise-wide reports and management functions across any of all

domains monitored by Spectrum servers.

"We're eager to get final enterprise view with distributed data management, but [we had] anticipated general availability in December,"

said Blair Sanders, a senior member of the technical staff at semiconductor manufacturer Texas Instruments, Inc.

He said he planned to have 25 Spectrum servers running by the end of the year to monitor sites regionally and globally from TI's worldwide headquarters.

Spectrum, page 114

Big mergers, big layoffs

Only the technically savvy will survive banking bombshells

By Thomas Hoffmann
and Neal Weinberg

Nearly 500,000 financial industry jobs are expected to be swept away in the next five years as merger-mania runs like a river through the banking landscape.

The \$10 billion merger announced last week between Chemical Banking Corp. and The Chase Manhattan Bank NA was only the latest example of how the



automation of banking functions and an intensifying shift toward electronic services are altering this industry.

For information technology professionals, those emerging unscathed and gainfully employed will possess technical skills to support client/server and distributed technologies, several chief information officers and industry experts said last week.
Mergers, page 119

Benchmarking bunk?

SAP accused of playing 'numbers game' with R/3 comparisons

By Julius King

Is SAP AG playing fast and loose with its R/3 client/server software benchmarks?

Last week, certain analysts said they thought so. Several users agreed. Even IBM and Digital Equipment Corp.—whose Unix platform is "SAP certified"—didn't exactly rush to the software vendor's defense.

What turned up the heat on SAP's client/server benchmark figures is a research report is-

sued last week by Illuminata, Inc. The Nashua, N.H., consulting firm specializes in distributed enterprise computing.

Among other things, Illuminata's report faults SAP for withholding information about testing conditions and failing to submit R/3 benchmark results for review under an independent auditing process.

"The way that SAP does benchmarks is indeed the counter. Each [platform] vendor and SAP knows how they do their benchmarks, but there is never any requirement that they tell anyone else," said Jonathan Egan, research director at Illuminata.

A SAP spokeswoman last week said the company had no executive benchmark, page 114

COMPUTERWORLD'S 9th ANNUAL SALARY \$ SURVEY

Unequal opportunity

Salaries on the rise, but women still underrepresented in top IS ranks

BY ALAN R. EARLS

The good news:

On average, information systems salaries increased faster than the national average for most other professions last year.

The bad

news: When it comes to IS jobs, women are still badly underrepresented, according to Computerworld's 9th Annual Salary Survey.

Overall, this year's survey found that women account for just over 37% of IS professionals, which is 7% below the na-

verage salary plus bonus for:

CIO	\$91,588
Communications manager	\$86,279
Senior systems analyst	\$81,918
IS manager	\$84,002
Help desk operator	\$29,486

tional average of women in the total workforce, according to the Department of Commerce.

Not surprisingly, it gets worse as you climb the lad-

der. Only 17% of chief information officers surveyed are women. Similarly, women account for only 17% of directors of networking, 24% of computer operations managers and 27% of voice and data communications managers.

Salary survey, page 70

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Microsoft
Windows 95

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COMPUTER INDUSTRY

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Falling revenue and mounting losses force a major restructuring at Tricord.

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PeopleSoft revs up product line

By John King

Next week, PeopleSoft, Inc. will announce some 200 enhancements to its suite of enterprise client/server applications. Six new financial and distribution modules are also forthcoming.

Leading off the lineup of enhancements is an embedded workflow capability, which observers said leapfrogs that already furnished by rivals SAP America, Inc. and Oracle Corp.

"With PeopleSoft 5.0, you can embed in the system some processes that are natural to your own business environment," said Barbara Nott, a senior research analyst at Meta Group, Inc. in Stamford, Conn. SAP's workflow capability, by contrast, is very structured, she said.

Other key enhancements across the full application suite include a new graphical user interface (GUI), an enhanced application upgrade tool and support for IBM DB2 relational databases on Unix platforms.

Taken together, changes built into PeopleSoft 5.0 represent a 25% to 40% increase in functionality over the current version, said PeopleSoft executives who briefed *Computerworld* last week.

The new GUI brings PeopleSoft up to speed with competitors' GUIs. The financial

and distribution modules, meanwhile, further extend its reach beyond the human resources area, where it has traditionally excelled with users.

But far and away the most significant enhancement is the workflow feature, observers said.

"I would have to put PeopleSoft ahead at this point on the workflow checklist," Nott said. "It is very much a catch up and a size competitive weapon in their arsenal."

Another leap in PeopleSoft 5.0, users said, is its new look and feel, which includes the addition of activity-based menus designed around users' business processes rather than the software's idiosyncrasies.

"Before, you had to go through the software module by module. If you wanted to do something in payroll, you had to go in

to that module," explained Kevin Goon, vice president and general manager of information systems at FRC Corp., a PeopleSoft 5.0 beta site in McLean, Va.

Now, by contrast, "there is no distinction between modules," Goon said. "Instead, users choose from a menu of business processes, and it's not even apparent what module you're in."

Under PeopleSoft's new agent-based workflow architecture, users can deploy pre-designed workflow procedures built into the software. Alternatively, users can design customized workflow templates using the vendor's set of fourth-generation language tools.

The architecture also includes a set of application programming interfaces for hooking in to third-party workflow products, such as Notes.

"On the accounts payable side, we're looking to use workflow for invoice approval," said Bob Goldschmidt, director of financial systems at Brown Group, Inc.'s Pagoda Division in St. Louis.

"As soon as an invoice comes in, this will allow us to route it online immediately, so it doesn't sit on someone's desk," he added.

PeopleSoft's new financial modules for budgets, billing and project costing are scheduled for general release in the fourth quarter.

On the distribution side, PeopleSoft 5.0's order management, inventory and distribution requirements planning modules will be available in beta versions later this year, with general release expected in the first half of 1996.

One county's client/server application is good enough to buy. See page 63.

Chain of Issues

PeopleSoft 5.0 furnishes workflow links to Notes and systems from Actix Technologies, Inc., Computer Communications Specialists, Inc., Edly Corp., Infotrac Corp., License Systems, Inc. and Tals Corp.

New features and functions of PeopleSoft 5.0

- ▶ Six applications in the financial and distribution areas.
- ▶ Workflow capability.
- ▶ Windows 95 like GUI and process-oriented menus.
- ▶ Client based data caching designed to reduce network traffic and boost response time.
- ▶ Enhanced application upgrade that automatically transfers customizations to new releases.

Early users give Notes 4.0 high marks

By Susana Mohan

Apart from a few items on the never-ending user wish list, the latest version of Lotus Development Corp.'s Notes is earning high marks from beta testers who have been tinkering with Release 4.0 for two months now.

"It's remarkable how much [Lotus] has been able to get done in one release," said Mark Johnson, chief executive officer of M3 International, a Notes developer in New York. "Not just [in terms of] the problems they've solved, but whole new areas of functionality they've introduced."

Beta success

Notes is a cross-platform environment for collaborative computing. The first beta of Release 4.0 was shipped to a limited number of users at the end of June.

The Cambridge, Mass.-based company expects to ship the product by year's end.

Lotus has frozen all features in its beta, thus guaranteeing they will appear in the final product.

One of the most significant new features is the Navigator tool. The Navigator lets users represent a process graphically so they can see

a map of a workflow, for example, and pinpoint where a purchase order might be in the process. The Navigator lets you establish hot spots on illustrations and then drill down on them," said Ken Reiser, co-founder of Elf Technologies, Inc., a Lotus business partner in Mercer Island, Wash.

Other changes from the earlier version include the ability to administer Notes servers from a single screen, ease of application development and support for larger databases.

Shooting the curve
Release 4.0 is "a whole different way of approaching Notes databases and Notes [electronic mail]," said David Marshak, an analyst at Patrick Seybold Group in Boston. "You have to relearn the Notes interface because it's more E-mail and [Windows 95] Explorer-like. You open a Notes database, and it will look like a map."

"Relearning the interface will be an issue, but [it is] unknown how big," said Ken Norland, a partner at Ernst & Young in Westlake Village, Calif.

If users are primarily using Version 3.x, the learning curve will be minimal; the new features build on those of the earlier version, Nor-

land explained. If users want to learn to use the Navigator, however, there will be a steeper curve to climb.

"That is why information systems departments need to be clear about what capabilities they plan to give their users," Marshak noted. In the past, users have worked with the "Views" feature, which is a way to present summarized data. Release 4.0 will give them maps, as well. "In some cases, using highly graphical things may slow people down," Marshak cautioned.

Whatever end users' needs might be, Notes managers will find administration a little simpler. Release 4.0 includes tools that will let administrators manage their servers from a single screen.

For developers, too, Release 4.0 offers a better deal.

LotusScript, a scripting language embedded in the new version, provides a friendlier development environment. "LotusScript turns Notes into a full-fledged development environment," Norland said. "The debugger lets you figure out where applications are going wrong."

Platform issues

One question Lotus needs to answer is how it will make OLE work across all platforms, said a user who asked not to be identified.

"For Notes to be cross-platform, developers need to be able to create objects that work on all platforms. Right now, [the objects] don't work on OS/2."

Correction

Due to a reporting error, "Notebook prices slipping down" (CW, Aug. 28) incorrectly stated that a report from BIS Strategic Decisions in Norwell, Mass., predicted that by 1995, a majority (51%) of PC users will use portables as their primary PC and that by the year 2000, that number will jump to 86%.

The correct information is that by 1995, 51% of portable computer users will use portables as their primary PCs, and 90% of portable users will use portables as their primary PCs by 2000.





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Big promises taint ATM

By Bob Wallace

Some analysts are charging that what appear to be highly polished and much-hyped ATM architectures actually harbor deficiencies serious enough to force some users to forestall moving to widespread use of the high-speed switching technology.

To date, use of Asynchronous Transfer Mode (ATM) products has been limited. By competing their ATM architectures, vendors were hoping to provide users with everything to build an enterprise-wide production ATM network.

However, the vendor community isn't there quite yet. Vendors are in fact scrambling to backfill those holes after whetting user appetites with big promises. This was evident in last week's tidal wave of ATM product, software and vendor alliance announcements. The collective groundswell should propel ATM onto center stage at the Network/Interop '96 conference at the end of the month in Atlanta (see chart).

The problem, according to analysts tracking internetworking vendors' ATM efforts, is that firms have been glossing over holes—sometimes glaring ones—in their blueprints (see story below). What is missing, they said, are the following:

- Some vendors have multiple ATM products but don't offer everything from backbone switches to PC adapter cards.
- Other vendors don't have a single product architecture for all their ATM products.
- Some vendors are caught up swallowing acquisitions that analysts said will make it difficult to reconcile multiple product lines under one unifying architecture.
- A few vendors, until now, were happy sell-

ing ATM products only to users with the very highest-end data applications.

Many second- and third-tier vendors are just trying to cash in on ATM and don't plan an ATM architecture anchored by several products.

In particular, analysts point to Cisco Systems, Inc. and 3Com Corp. as having the most work ahead of them. That is because the duo are reconciling multiple product lines brought aboard from acquisitions and alliances.

In short, it appears that—vendor claims to the contrary—there aren't any complete ATM architectures.

Impossible architectures

Some leading-edge users are aware of vendors' limited ATM product lines.

"Every major networking vendor, and many smaller ones, have a market architecture, or 'market-features' as we call them," said a network manager of a Fortune 500 Northeast pharmaceuticals giant who requested anonymity. "And it's absolutely true to say that many of them are far from complete."

Worse, many ATM strategies are incredibly complicated and require users to be experts in the product lines of countless vendors. That's "impossible," complained the network manager, who ran an ATM pilot project at his company to gain experience with ATM. "Only Pure Systems had the complete package for us," he said.

For its part, Cisco is working feverishly to port its Cisco IOS for ATM core software to the products it has acquired. That software supports a common set of ATM capabilities

that will allow its products to interoperate.

"The modular Cisco IOS for ATM is really what will tie everything [from Cisco] together, though that's an evolutionary process," said David Beaman, senior ATM product manager at Cisco. "We're porting it to the Lightstream 100 to be followed by the [Lightstream] 202X."

Cisco acquired ATM start-up Lightstream Corp. and its 100 and 202X switches earlier this year.

Another early ATM user agreed. "Vendors face an interesting problem," said Bill Berry, co-director of Amoco Corp.'s Aires project, which is an ATM demonstration network. "No single vendor can offer you a complete end-to-end working ATM network today. And there are users with checkbooks open who are ready to buy into the technology."

Vendors are hoping users will start buying what is available, but users seem wary. Despite user confusion about which vendors are headed in what direction and incomplete vendor product lines, analysts hold out hope for ATM.

"It won't be too long before vendors have a complete ATM architecture," said Tom Nolle, president of CIMI Corp. "IBM will have everything by the first quarter of 1996, while Newbridge and Bay will soon have the same scope of products as IBM. All Bay needs to do is forge an alliance with an ATM [backbone] switch vendor, and Newbridge only needs 23M bit/sec. ATM adapters."

Strategic review

In interviews last week, two ATM industry watchers evaluated the state of "market-features." Offering opinions were Tom Nolle, president of CIMI Corp., and Skip MacAskill, a senior research analyst at Gartner Group, Inc. • Cisco Systems, Inc.: "They have an ATM interface for [their 7000 high-end backbone] router, but they can't provide it at a price more can easily pay," Nolle said. "And I've yet to see a strategy for taking ATM to more mainstream products." • Bay Networks, Inc.: "Bay has less rigorously articulated its plan than Cisco, but with the acquisition of Cessillion, it can deliver ATM to the desktop at 23M bit/sec., which is widely consumable," Nolle said. "Their story will likely change with their [upcoming] ATM strategy announcement. [But]

they've got some integration to do."

- Pure Systems, Inc.: "They're done very well selling ATM to the experienced users and have exploited the hobbyist, but their biggest challenge is selling their products into a much broader market," Nolle said.
- Newbridge Networks, Inc.: "Newbridge took a leadership position with ATM but had problems delivering products, so some people wrote them off," MacAskill said. "But they're back in the picture with their Ethernet-to-ATM products."
- 3Com Corp.: "They jumped into ATM when they bought NioCo, which gave them an ATM switch," MacAskill said. "But by buying Chipcon, they're buying into a potential headache. They have all the pieces, but the change they face is reconciling NioCo's architecture, LAN emulation and network management plans with Chipcon's."

—Bob Wallace

Only have it

ATM blitzkrieg begins

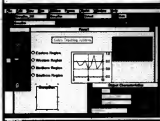
Vendor	Product/Technology	Features	Price Availability
Agile Networks	LAN emulation capabilities across its ATMster product line	Enables LAN emulation support in switches instead of stand-alone servers	Q3 1996
Connectware	CELLentry ATM starter system	Includes a 6-port ATM switch and ATM adapters	\$10,990 (USA); \$9,995 (PC) November
CrossComm	ATM Edge Switch module	Lets users link legacy LANs to ATM networks	\$10,995 starting price includes 24 ports and 155M bit/sec. ATM uplink/downlink
Efficient Networks	LAN emulation server software	Lets users link legacy LANs to ATM networks	\$9,995/line
General Datacomm Industries	Multipoint Video Server (MVS) and multimedia interface	Uses ATM to support data-intensive applications	\$1,000 to \$10,000 per port (MVS); \$6,000 to \$65,000 per interface end of 1996
IBM	Wayss ATM Workgroup switch	Offers ATM switching to users in workgroup networking environments	Not available/Q3 1996
Orbicon Networks	CS-4000 ATM access concentrator	Lets users build private ATM networks and access wide-area carrier ATM services	\$5,450 starting price/Q3 1996
Ayan	OmniCell switching for the OmniSwitch	Supports ATM switching at 23M, 155M and 622M bit/sec.	Not available/Q3 1996
Applix	7000 Series ATM switch line	Supports ATM at 23M bit/sec. to the desktop	\$10,995 (46-port ATM switch); \$7,995 (23M ATM LAN switch)/Q3 1996
ZeNet	2-ATMulator	Server software modules	\$3,995/October
	2-ATMplanner	Developer's kit for ATM application development	\$500/October
	2-ATMmanager/2-ATMguard	Server configuration tool/software add-on	\$89/October



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Business users whip through Win 95 installs ...

Many opt for Premier support, work out problems in advance

By Stuart J. Johnston

While many consumers who purchased Windows 95 error that Microsoft Corp.'s technical support engineers are scarier than bears' teeth, early corporate adopters appear to be having little trouble with the new system.

The long waits in phone queues and constant busy signals jamming Microsoft's consumer phone support lines qualified as Windows 95's second major media event last week. The first wave of new buyers desperately used antidiarrheals to try to get through.

However, most corporations that committed to immediately rolling out Windows 95 took part in the nine-month beta program and had already worked out most of the installation and con-

figuration problems, said several users interviewed last week.

Additionally, many are large users of Microsoft products and purchased Microsoft Premier support contracts. Although they are expensive at a base price of \$25,000, these contracts assure users support professionals and fast response times. These Premier contracts cover all of Microsoft's products in use at these companies, not just Windows 95.

"We haven't had any problems getting through to Microsoft, and we haven't had to call them [much] because we were a beta site" for Windows 95, said Craig Reitzel, president of Systonix, Inc., a network integration firm in New York. Systonix is also a Premier support client.

"We are tech support, [and]

Windows 95 installation is going fine," said Greg Scott, information services manager in the College of Business at Oregon State University in Corvallis. Although Oregon State isn't a Premier customer, Scott's group has a beta site and hasn't had to call Microsoft "because we had all the big issues handled in advance."

In a random poll last week of corporate early adopters, the half-dozen sites that responded said they either had trained

their own people to handle problems, have Premier support contracts or both. None were concerned about technical support issues.

Indeed, callers to Microsoft's Premier lines have not encountered any busy signals since the launch. The average wait on hold has been less than 60 seconds, according to Deborah Williamson, Microsoft's vice president of support.

Premier customers seem to bear out this assertion.

"I've had four problems [since the launch], and I haven't had any problems getting through to Windows 95 support," said Brice Stephens, advanced scientific system coordinator for the Space Science Laboratory at NASA in Huntsville, Ala. Stephens' group, both a beta site and a Premier support customer, has already deployed 451 copies of Windows 95 and will deploy another 500 in the next two weeks.

Windows 95 fever hasn't af-

Record time

The time it took to sell 1 million various Microsoft operating systems*

MS-DOS 6.0	40 days
Windows 3.1	50 days
Windows 95	4 days

*Includes retail sales of new and upgrade packages; doesn't include mailboxes for Windows 95 shipping with new PCs or unit sales to corporate customers.

fected support for other Microsoft products, according to an information systems manager at a major Northwest manufacturing firm.

"I always reach someone pretty quickly [at Premier support] when I call about Windows NT and the BackOffice services suite," said the manager who asked not to be identified.

Application vendors continue to have their Windows 95 strategy. See page 53.



@Talkback@cw.com

Have you encountered anything out of the ordinary when installing Win 95 or running it against your network or applications? What has your experience been thus far with Windows 95? Sendoff to us at talkback@cw.com. Please include your full name. We will publish a sampling of reader opinions in an upcoming issue.

... as consumers seek solace via on-line forums

Virus hits some; calls flood into general support lines

By Tim Ouellette

Constant busy signals on Microsoft Corp.'s Windows 95 support lines have some users turning to on-line services to vent their frustrations and find answers to the roadblocks they are encountering with the new operating system.

For many users — and there were many, with a minimum of 1 million copies of Windows 95 sold after four days on the shelf — the installation process was like a hangover after the initial marketing kick-off euphoria.

The triple whammy of a new installation process, documentation that many on-line users called "disgraceful" and a large number of novice users resulted in jammed phone lines at Microsoft and its five support partners.

Rather than wait up to two hours for assistance, many users headed for cyberspace. They turned mostly to commercial on-line services, especially CompuServe, or the unmoderated Windows 95 Internet newsgroup.

One recurring problem for some users trying to install the 32-bit operating system from diskettes was a tendency for a PC to halt when it tried to read the second dis-

kette. Microsoft has since claimed that a pre-existing virus on users' PCs activated by the first disk was changing the format of the second disk, so the PC could not read it.

No information was available on where the virus came from or if it was designed specifically to hit Windows 95. Last week, Microsoft released a statement that stressed that the steps users can take to work around the virus are just that.

Some common problems with Windows 95 mentioned by users in on-line forums, along with Microsoft's recommended solutions

Problem	Six
• Setup program does not recognize diskette #2	• Perform a virus scan before installation.
• Setup program stops responding	• Flip up tab in the top left corner of the disk that write-protects the disk and keeps the virus from corrupting it. Though user registration information won't be written to the disk, the rest of Setup should conclude normally.
• Windows 95 does not recognize peripherals	• Reboot the system and choose "Safe Recovery" option when prompted.
	• Check to see if the hardware works with 32-bit systems.

• workaround — and that the diskettes must be replaced if they are infected (see chart).

Microsoft added that the problem hits the second disk because Windows 95's setup writes customer registration information to this disk, on which the virus then installs itself. The company pointed out that the Windows 95 software isn't the source of the problem.

In on-line exchanges, several users said they were returning their copies of Windows 95 because of this problem. But other on-line users said that with the CD-ROM installation, the setup process went through without a major hitch. Datagroup, Inc. estimates that up to 25% of all PCs in use have CD-ROM drives.

Most of the queries posted in the on-line discussion groups centered around configuration issues with drivers for peripherals, including CD-ROM drives, multimedia accelerators and printers, which apparently were not working well. For example, sometimes whole hard drives were wiped out when users tried to install Windows 95 with an already existing memory manager program other than Microsoft's memory manager.

A Microsoft support spokeswoman said calls were higher than expected for the first few days — even after the Redmond, Wash., plant spent upward of \$500 million for support — due to a rush of users buying and installing the software right away.

She said calls also took a little longer than expected, sometimes 25 to 30 minutes, because of the number of novice users trying Windows 95 and the technical expertise of the support staff. She said the experts came to be reduced as support staff became more experienced.

However, Joel Diamond, on-line director of the Windows User Group Network in Media, Pa., suggested that "more people installing Windows 95 have more experience than the people taking support calls for Microsoft." He expects the migration to Windows 95 applications to trigger the next serious round of questions.

Few returns of Windows 95

Though some industry watchers said return rates for Windows 95 were higher than expected, retailers such as MicroAge, Inc. in Phoenix, stated that sales were solid and returns were low.

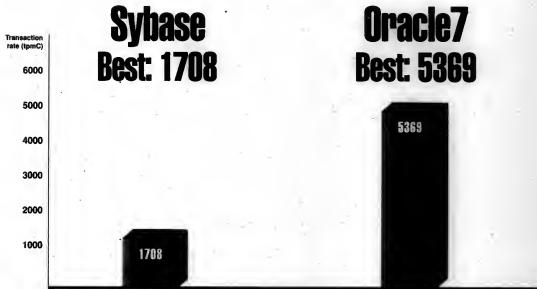
"We had a record Microsoft month," said Jay O'Callahan, a spokesman for MicroAge. Microsoft-related software sales were at their highest levels ever for a consecutive month, he added.

"We are not experiencing many returns of Windows 95, and sales are exceeding our expectations and continue to be strong," agreed a spokeswoman for CompUSA in Dallas.

Another computer retailer, Elek-Tek, hasn't seen a jump in its regular product service calls or returns, said Sandra Burns, director of marketing. She added that the Shockle, IL-based chain does not accept returns unless the software is defective. — Tim Ouellette

Database Performance

The TPC-C™ test is the industry standard benchmark measuring database On-Line Transaction Processing (OLTP) performance. On July 24, 1995, Hewlett-Packard published an audited TPC-C benchmark of Oracle7 that set the record for open systems performance, beating Sybase System 10's best result on any computer by more than 200%. (It's almost not worth mentioning, but we also creamed Informix.)



Sybase's CEO recognizes they have technology and performance problems. So should you.

"We were slow to realize this [scalability] was an issue in the marketplace."

Mark Hoffman, Sybase CEO, *The Wall Street Journal*, April 14, 1995

"We're trying to investigate the problems now. You peel back the onion, you find out more stuff."

Mark Hoffman, Sybase CEO, *San Francisco Chronicle*, April 5, 1995

Experts and customers recognize that Sybase's problems will take a long time to fix. So should you.

"The time between major enhancements of their [Sybase's] database is the longest of any major vendor."

Salomon Brothers, *Computersworld*, April 17, 1995

"They've got a lot of work to do and they have to go pretty deep in the core of the code."

First Albany, *Information Week*, April 17, 1995

Scalability and parallelism make Oracle7 the technology and performance leader. The results of the HP TPC-C benchmark provide graphic proof.

"Oracle has set the high water mark for open systems platforms. We look for more to come."

Jim Johnson, Chairman, Standish Group, July 24, 1995

"Oracle's TPC-C numbers dramatically alter the competitive landscape...Oracle is telling the competition to put up or shut-up."

Peter Kattner, Vice President, Aberdeen Group, July 24, 1995

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Yahoo! features rush to strike Web

By Kim S. Nash

Yahoo Corp., creator of the popular Yahoo World Web site that lets users search the Internet by key words, plans to launch a string of features and on-line products in the next several weeks, company officials confirmed last week.

The move is timely because 17-month-old Yahoo faces competition from both

costs of doing the same task on-line.

"We can't sit still by any means. We know what's out there," said Randy Haykin, Yahoo's vice president of sales and marketing.

In fact, Mountain View, Calif.-based Yahoo wants to go beyond being an Internet resource to become a cyberspace Yellow Pages, Haykin said. The company is talking with "the major" on-line services about providing searchable directories for them similar to what Yahoo has done for the Internet, he added. He declined to say when the company might sign any deals.

Meanwhile, Yahoo wants to make money from its name recognition. Due to debut this week is Web Announcements, a for-fee service from Yahoo that highlights new Web sites beyond Yahoo's existing "What's new" listing.

For \$750 to \$1,000, firms will be able to announce their home pages to Yahoo users with promotional

draw users to the new site, Haykin said. Such a service appeals to Chuck Green, president of CMC Corp., a Unix and Internet consulting firm in Chicago.

Green, who is building a Web site devoted to business and cultural issues that African-Americans face, said he would pay to have Yahoo give his spot special attention. "A lot of people pass through Yahoo, and I wouldn't mind having them look at our Web site," he said.

For what it takes to run a Web page right, see page 53.

Yahoo! a hit	
The Yahoo site on the Web is poised to become even more popular: Microsoft chose Yahoo as the primary directory for The Microsoft Network	
Visits per day to Yahoo	2.6 million
Monthly growth rate	5.4%
Number of users per day	Approximately 750,000
Average number of clicks per user per session	6 or 7

Source: Internet Profiles Corp., San Francisco

on- and off-line rivals. Internet directories, such as InfoSeek Corp. in Santa Clara, Calif., and Lycos, Inc. in Wilmington, Mass., are strong contenders for users who need help navigating cyberspace.

But also emerging are off-line research tools offered on more traditional software and CD-ROM media. Lerdic-Nim, Inc., for example, last month introduced a CD-software combination that contains a library of images and documents for the legal field. The goal is to let users search the listing from their desktops, eliminating the dial-up and connect-time

SEC bends to public interest, posts financials on Internet

By Mitch Betts

WASHINGTON

The information systems department at the Securities and Exchange Commission (SEC) last week got the go-ahead to put its vast database of corporate financial statements—called Edgar—on the World Wide Web.

Edgar will join Thomas, the Library of Congress' legislative database, adding to the dozens of other federal Internet sites that offer free public access.

But public interest groups want Congress to do far more to provide electronic access to government information.

For example, late last month, a coalition that includes the Taxpayer Assets Project, the Congressional Accountability Project, Common Cause and the Electronic Frontier Foundation, urged House

Speaker Newt Gingrich (R-Ga.) to keep his oft-stated promise to put all legislative documents on-line.

Thomas has the Congressional Record and the text of new government bills. But the coalition House and Senate bills. But the coalition said citizens don't have fast access to the kinds of insider documents that high-paid Washington lobbyists get.

The groups urged Gingrich to provide on-line access to committee reports and amendments, hearing transcripts, voting records, campaign finance reports and the text of proposed amendments.

The coalition went so far as to suggest that proposed amendments shouldn't be considered officially introduced until they are posted on-line.



The Library of Congress' Thomas provides the public with access to a legislative database

"While citizens are searching Thomas, lobbyists are huddled with paper copies of committee prints and manager's amendments, so citizens only have the appearance of equal access, not the real thing," charged James Lown, director of the Washington-based Taxpayer Assets Project founded by Ralph Nader.

A spokesman for Gingrich's office said the Library of Congress is "working aggressively" to put all of the documents

on-line as soon as possible.

Love said he was pleased that the SEC agreed to put Edgar on the Internet because an experimental Edgar site operated by New York University and the non-profit Internet Multicasting Service will run out of grant money Oct. 1.

"We were going to put up a Web site anyway, so the cost to add Edgar access is fairly modest," said Michael Bartell, the SEC's chief information officer.

IS staffs no longer need to program security into tech app. See page 45.

News Shorts

AT&T, Motorola split PCS contract

AT&T Corp. and Motorola, Inc. will split the coveted \$1 billion contract to supply Personal Communications Services (PCS) gear to PCS PrimeCo, the joint venture of Bell Atlantic Corp., Nynex Corp., US West, Inc. and AirTouch Communications. PrimeCo has already paid \$1.1 billion for PCS licenses in 11 metropolitan areas. PCS PrimeCo has opted to base its network on Code Division Multiple Access cellular technology.



One Word: Virus

There's a pest infesting four versions of Microsoft Corp.'s word processing software—Word 6.0 for Windows 3.1, Word for Macintosh, Word for Windows NT and Word for Windows 95. The virus infects the software when users swap files from an outside copy of Word, but it doesn't cause loss of data. Microsoft tools to detect, remove and prevent the virus can be found on the World Wide Web at www.microsoft.com.

On-line? Join the crowd

The number of users of on-line services

such as America Online and Prodigy increased 37% to 8.5 million in the first half of 1996, according to a study from Simba Information, Inc. CompuServe remains the largest of the Big 3, with 3.2 million users. Another 2.5 million subscribers are expected to go on-line by the end of the year, with interest fueled by The Microsoft Network, according to Simba.

'Kitchen-sink' switch debuts

Start-up Xylan Corp. last week announced a 13.2G bit/sec. Asynchronous Transfer Mode switching core called

OmniCell that will enable its OmniSwitch to support Ethernet, Token Ring, 100Base-T, Fiber Distributed Data Interface and Copper Distributed Data Interface in one box. Pricing for the nine-slot OmniSwitch starts at \$13,000.

Candle lights up new product

Candle Corp. in Santa Monica, Calif., said it expects within the next month to offer general availability on the first pieces of its delayed product line for monitoring distributed systems. The Candle Command Center, Candle's effort to move beyond the mainstream market, supports visual programming and application-level monitoring. It will initially control Unix systems from IBM's OS/2-based consoles tied into MVS mainframes.

In the palm of your hand

The New York Stock Exchange's plans to replace floor brokers' pencil-and-paper order books with handheld computers was approved last week by the Securities and Exchange Commission. The handheld computers are part of a \$125 million technology

upgrade by "The Big Board." Other proposed improvements include the use of cellular telephones and installation of computer screens on the exchange floor.

Kahn sells stock

In a sign that the company is not a likely takeover candidate, Borland International, Inc. Chairman and Founder Philippe Kahn has sold more than half of his stock in the company, according to filings with the SEC. Kahn still owns 2% of Borland.

Stratus slashes staff

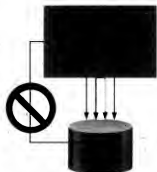
Stratus Computer, Inc. announced last week it would lay off 500 employees, or 10% of its workforce, to cut costs in the face of declining profit margins and disappointing sales. The Marlboro, Mass.-based systems maker said the layoffs were across the board in manufacturing, sales and administration. The cuts will be completed by January.



Application Partitioning

The network links the client to the server. The client and the server communicate by sending messages across this network. The number of messages exchanged between the client and the server is critical in determining overall system performance. Oracle Developer/2000 drag and drop application partitioning makes it easy to minimize the number of messages exchanged between a client and a server, optimizing both response time and system performance.

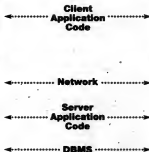
Sybase PowerBuilder



PowerScript does not run on the server, therefore drag and drop application partitioning is impossible

An application program developed with Sybase PowerBuilder 4.0 must run entirely on the client computer. The above program enters a purchase order into the database. If this application is built entirely using PowerBuilder 4.0, every item purchased requires a separate pair of messages to be exchanged between the client and the server computer. Therefore, a simple ten-line purchase order requires at least 20 messages to be passed on the network. This high volume of message traffic will slow response time for an individual user, and bottleneck the entire system with a large number of users. And there is no easy way to fix this.

Oracle Developer/2000



PL/SQL runs on the client and server, therefore drag and drop application partitioning is easy

Contrast this with the same exact application written with Developer/2000 and tuned using drag and drop application partitioning. It takes a few seconds to drag that portion of the application that communicates with the DBMS off the client computer and drop it onto the server. Now, when you enter a purchase order using the newly partitioned application, only one pair of messages is sent from the client to the server—regardless of how many items are in the order. The optimally partitioned application delivers instantaneous response time to an individual user. And the partitioned application can support ten times more users than when the application ran entirely on the client computer. If you have more than a handful of users on your network, call Oracle for scalable software. 1-800-633-1071, ext. 8192.

Seeing Is Believing!

Watch a video of Larry Ellison showing you how to take advantage of the second generation client/server technology in Developer/2000. Download Larry's demo off the net at <http://www.oracle.com/info/video.html> or, call for a free video 1-800-633-1071, Ext. 8192.

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Patent feuds erupt on the Internet

Two firms claim ownership of key technologies

By Mitch Betts

With visions of licensing fees dancing in their heads, two tiny companies recently stanned the Internet community by claiming they have legal ownership

rights to key technologies for electronic commerce.

This could signal the beginning of legal hassles surrounding Internet technologies, experts said. Traditional patent disputes often end in licensing deals or

out-of-court settlements and rarely affect customers. But because of the early stage of these patent fights, the potential results are unclear.

In one case, start-up Eolas Technologies, Inc. in Chicago announced it has exclusive rights to a pending patent that covers small, plug-in program objects

that are embedded in World Wide Web documents. For example, a so-called Weblet could be a video playback program or a software agent that retrieves certain data from the Web.

Michael D. Doyle, the firm's chief executive officer, said Sun Microsystems, Inc.'s Java programming language and Netscape Communications Corp.'s Web browser are among the commercial offerings that would infringe on the patent if it is approved.

Doyle hopes to obtain licensing royalties and hasn't yet threatened to file suit.

Doyle's announcement sent shock waves through Sun, Netscape and the Internet community. A spokeswoman for Netscape in Mountain View, Calif., said it is impossible to know if there is infringement because the technical details in the

patent application are secret until the patent is granted. In this case, it

could be a year before Sun and Netscape get a chance to see the patent details.

"He's launched a pre-emptive strike, but we can't answer it" because the patent claims are unpublished, said Lee Pritch, vice president for intellectual property law at Sun, also in Mountain View.

Critics said Doyle "jumped the gun a little bit" by trying to extract royalties before the patent is public. Doyle responded that it would have been unethical to spring the patent on vendors in a year or so.

In a separate case, Interactive Gift Express, Inc. in Secaucus, N.J., last month filed a lawsuit claiming that 18 companies are infringing on its patent for certain on-line shopping transactions. The suit requests unspecified financial damages.

The 1965 patent covers the sale of digital products, such as software, fonts, multimedia clips and on-line news, that are downloaded to a point-of-sale terminal such as a PC, said Arnold Freilich, president of the company.

A patent gives the holder a 17-year monopoly, but licenses can be granted for others to use the invention. Freilich said he prefers licensing to litigation, but "you're not taken seriously unless you sue."

Freilich's suit, filed in New York, has such big-name defendants as Adobe Systems, Inc., CompuServe, Inc., Insult, Inc. and McGraw-Hill, Inc.

Greg Aharonian, editor of the Internet Patent News Service in Belmont, Mass., predicted that this is just the start of patent infringement cases affecting the Internet. "Throughout the 1990s, a variety of patents were issued that can be generalized to be applicable to the Internet and related forms of electronic sales."



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IBM promises fast P6 system deliveries

Company gearing up with refreshes and Pentium introductions in the fall

By Jalikumar Vijayan

IBM last week revealed it will be ready to start shipping its first P6-based systems as soon as the technology becomes available later this year.

The P6 is Intel Corp.'s sixth-generation 32-bit microprocessor slated to be announced in the fourth quarter.

IBM also outlined plans for a sweeping round of refreshes to its current stable of products and Pentium system introductions in the next few months.

The moves are expected to erase the recent market perception that IBM has somehow slipped behind the Pentium curve, analysts said. In recent months, rivals Compaq Computer Corp. and Hewlett-Packard Co. have consistently beaten IBM to the draw with major pricing and product announcements.

"IBM is latent on getting back on top of the technology curve... so that they can be seen as a quick-to-market, top-tier leader," said Richard Zwetschenbaum, an analyst at International Data Corp. in

Framingham, Mass.

The strategy is a welcome change, but a lot depends on IBM's ability to execute, said Marshall Purnhach, network control manager at the American Medical Association in Chicago.

"It looks like an aggressive move on their part. The real key is going to be their capability to deliver enough volume. That's been their problem in the past," Purnhach said.

Users such as Vincent Pype, a distributed systems administrator at Washington Mutual Savings Bank in Seattle, welcomed IBM's moves but maintained that in the past, IBM has been quick with market with new products.

Nice match

IBM's first P6 system will start shipping to volume by the first quarter of 1996. It will be positioned as a mainstream commercial workstation aimed at 32-bit operating systems and application environments, said Rod Atkins, vice president of commercial desktops. The system will cost about \$4,000 (see chart).

"We think the P6 is a great platform for

OS/2," Atkins said. IBM's P6 system will also support Microsoft Corp.'s Windows NT and Windows 95, although the primary focus will be on OS/2, according to Atkins. Recent reports and benchmarks have shown that P6 beta systems run Windows 95 applications slower than Pentium systems.

Meanwhile, IBM also plans to be among the first out of the block with PCs based on Intel's upcoming high-performance 150- and 166-MHz Pentium chips. Both chips are expected to be released

before the end of the year.

In the first quarter of next year, IBM will also refresh its PC 700 series of commercial desktops. According to Atkins, IBM will migrate several features from its portable products to the desktop. These include the following: full-motion, full-screen Motion Picture Expert Group video, fax, telephony, business audio and infrared support. The systems will support the 150- and 166-MHz versions of the Pentium chip.

Would be competitors slip in efforts to vie with Pentium. See story, page 40.

What IBM has in store for P6

- 150-MHz P6 processor
- 64M-byte RAM, up to 2G-byte hard disk
- Eight expansion slots, six drive bays
- Fast SCSI, high-performance graphics adapters, 3D-SIM
- Cost: Starts at \$4,000
- Planned Q4 announcement
- Volume availability: Q3 1996

Notebooks lead the way

A part of its multigrounded Pentium product strategy, IBM this week will also start shipping upgraded multimedia ThinkPad notebooks with Pentium chips.

The company also confirmed it has slashed prices on some of its 486-based ThinkPad notebooks.

The ThinkPad 755C-D, 755C-V and 755C-DV multimedia notebooks will be upgraded to include Pentium chips with 556K-byte secondary cache and an integrated 28.5K bit/sec. modem. The 755C-D will cost \$5,488; the

755C-V, which has a snap-off screen that enables it to plug back on top of many different overhead projectors, will cost \$5,948; and the 755C-DV will cost \$5,648.

In addition, IBM is dropping prices on the 486 versions of the ThinkPads. The 755C-D has been reduced from \$6,080 to \$5,148, the 755C-V from \$6,000 to \$5,248, and the 755C-DV will cost \$6,348, down from \$7,548.

IBM's price cuts follow recent reductions by HP and Digital Equipment Corp. — *Mindy Blodgett*

Backup options expand across the board

By Steve Moore

Users were bagged with tape backup options last week as five vendors launched products ranging from simple, single-server LAN utility software to high-speed automated backup systems for large databases and Unix networks.

Three of the client-server products were aimed primarily at Novell, Inc. NetWare users,

while two added support for Unix and Microsoft Corp.'s Windows NT (see chart).

Some users applauded a high-end backup brew consisting of Jetserve software from Chayenne Software, Inc. in Roslyn Heights, N.Y., and the JetArray digital linear tape hardware from Storage Dimensions in Milpitas, Calif.

"I now have 14 PCs running to back up our servers in the [time] window I have available, but with [digital linear tape] I can use one dedicated server to do the same amount of work as five equivalent PC systems," said Mike Cookin, a LAN manager at the University of Chicago.

A Chayenne spokeswoman said the single-server, jammy-based Jetserve technology targets budget and other organizations that must back up super-servers several times daily within half-hour backup windows.

Releases from multiple vendors run the gamut

Simple backup products such as Jetserve capture disk partitions and volume layouts as well as files. This type of backup is catching on because it is "faster than file-by-file backup," but it still allows users to restore a single file when

needed, said Mike Peterson, president of Strategic Research Corp. in Santa Barbara, Calif.

For its part, Exabyte Corp.'s EDR-8700 8mm tape drive kit "in the first of its kind in giving users a choice of [backup] soft-

ware on CD-ROM instead of bundling only one choice" with tape drive hardware, said Parsh Yale, a principal analyst at Datquest, Inc. in San Jose, Calif. Users can test-drive different backup products and choose the one best suited to their environments, she said.

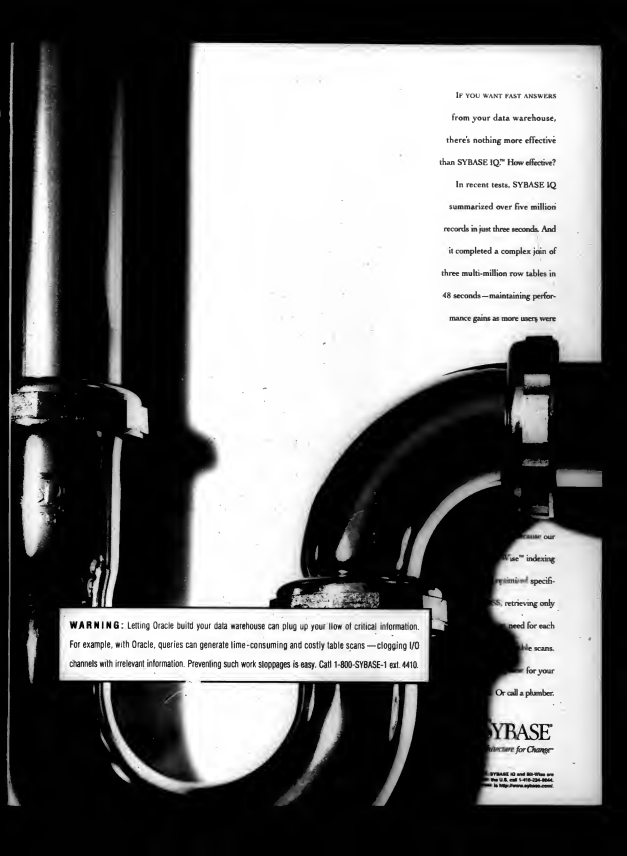
But some users said they don't need any backup help. With all of his organization's critical data on a Hewlett-Packard Co. RAID subsystem, that acts as "a big guardian, we have decided not to move to any backup products," said Chris Radzinski, manager of technical services at Weldwood of Canada Ltd. in Vancouver, British Columbia.

The new entry-level backup product, Legito Data Backup Utility, is from Legito Systems, Inc. in Palo Alto, Calif. It is intended to "weed the market" for NetWorker, Legito's premiere backup product, Peterson said. Because half the PC LAN networks have as more than two servers, "they would be candidates for this [product]," he added.

Backup baggage

A bevy of backup software packages were released last week

Vendor/Product	Description	Availability	Price
Chayenne Software Roslyn Heights, N.Y. Jetserve	Single-server, image-based, RAID 5 software backup software	Shipping	\$4,995 (5 tape drive) \$17,995 (8 tape drive)
Exabyte Boulder, Colo. EDR-8700	Backup kit with 146-byte external drive tape drive, bundled with NetWare, Windows NT or DOS/Windows backup software from Arcade, Chayenne or Palindrome	This month	\$2,495
Legito Systems Palo Alto, Calif. Legito Data Backup Utility	Software for backing up a single NetWare server to a single tape	Shipping	\$50 (U.S. customers) \$70 (non-U.S. customers)
Spectra Logic Boulder, Colo. Alexandria Backup Liberator 3.0	For high-speed, unattended tape backup of large databases and Unix networks	Shipping	\$2,500 to \$35,000 (price varies; \$250 to \$400 (client license))
Storage Dimensions Milpitas, Calif. JetArray	1200-1600 digital linear tape drive enclosure housing four high-speed DLT4000 drives; integrated with Chayenne's Jetserve	This month	\$38,000



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Flash that decoder ring

At last, decoder rings for grown-ups have arrived.

And new information systems managers may need to track the ring sizes and network addresses of users in the future.

Dallas Semiconductor Corp. last week struck up a partnership with jewelry maker Jostens, Inc. to offer ring as an alternative to pass keys, access cards and other authentication devices.

Each Decoder Ring houses a uniquely addressed memory chip, called a Touch Memory Button, that is furnished with data files like a disk. Brief contact with a Touch Memory probe connected to a computer system can authenticate the wearer and enable data exchange.

Users are less likely to forget a ring than similar devices provided on badges or key chains, said Phil Castel, senior product manager at Dallas Semiconductor.

A warehouse test site tracked items removed from a secure area with the

rings and probes, and the Indonesian Army is seeking 100,000 rings to store medical records and encryption/decryption keys, according to Microm



Touching the Decoder Ring to a computer probe can enable access to a PC or network.

applied-based Jostens.

A single sterling silver Decoder Ring costs \$20.50, but prices drop for quantity orders and nonprecious metals. Dallas Semiconductor offers a \$70 Touch Memory kit that includes two buttons that can be attached to a key chain, an interface that connects to a parallel port and PC software.

—Patrick Dryden

Spectrum stalls

CONTINUED FROM COVER 1

Sanders hasn't assessed the impact of the test extension, but he said it sounds right given the changes to such a large suite of software. His concerns center on converting data to the new format and avoiding deployment delays for new Cabletron hardware that must be managed by the new Spectrum software.

The U.S. Postal Service had hoped to have 15 new-version Spectrum servers

use, so we'll risk it."

The actual beta-test cycle won't begin until sometime in the fourth quarter, with release of Spectrum Version 4.0 expected near the end of the first quarter of 1996, said Bill Tracy, engineering director for Spectrum applications at Cabletron in Rochester, N.H.

"We need a long beta-test period for the new database architecture, reporting applications and alarm forwarding system," he said.

Version 3.0 of Spectrum, released a year ago, paved the way for the new infrastructure technology in Version 4.0, which removes middle steps to write archive data directly to servers in a compressed format. Tracy said (see story at right).

"We've retained the radical changes within Cabletron products so we won't disrupt a lot of applications," Tracy said.

At the Postal Service, McPhillips relies on Spectrum to manage about 450 routers

and thousands of hubs, switches and other gear. He wants to remotely manage about 1,000 servers and prepare for growth that could add from 3,000 to 15,000 LANs throughout the Postal Service in the next few years.

But he needs Version 4's database to support such extensive management

Benchmarking

CONTINUED FROM COVER 1

utilities available to comment on Illuminata's report or SAP's R3 benchmarking procedures. "Benchmarking is something we need to do a better job with," she acknowledged.

On the user side, Merisel, Inc., a computer distributor in El Segundo, Calif.—and SAP's largest U.S. R3 site with 430 users—has found discrepancies of more than 50% between transactions per hour benchmark figures furnished jointly by SAP and Hewlett-Packard Co. and its own performance tests on live systems.

"The problem is that the benchmarks don't really reflect reality," said Frank DeWitt, Merisel's vice president of information and technology.

"We've really had to reset the expectation," he added. Benchmarking can have real value to customers, but only if users "know exactly how a system was set up, what operating system was run, what databases were used and what release numbers were used," Egan said.

Earlier this year, IBM, Digital and HP all eagerly touted the favorable R3

benchmark numbers SAP had calculated for their respective systems.

But last week, IBM and Digital acknowledged that SAP's benchmarks are of limited real-world use to customers. This is due to inconsistent testing procedures and SAP's "less-than-full disclosure of benchmarking parameters set at its testing facility in Wulsdorf, Germany."

SAP has a very convoluted way of reporting results. They report them in different ways for different vendors," said Jerry Haight, marketing manager for Digital's Alpha 8400 server line.

Digital and SAP jointly conducted R3 benchmark tests for Stonebase, Inc. in Grand Rapids, Mich. "But realistically the transactions they used in the benchmark didn't equate to anything like the transactions we would be putting through the level system," said Craig Green, a database administrator at Stonebase.

There are those who believe that no vendor benchmark could ever rival another customer's experience in terms of usefulness. "The best way [to find out about a system] is to ask someone who is using it," said Walter Curd, information systems manager at Fujitsu Microelectronics, Inc. in San Jose, Calif.

shrink from 1.70 bytes to about 700M bytes. McPhillips was installing a pre-beta version of the distributed data manager last week to test report writing.

At TI, the new data format speeds the exchange of management data among test Spectrum servers and lowers the traffic overhead on the network, Sanders said.

Cabletron and partners will boost Spectrum's systems management capabilities. See page 33.

Cabletron shrinking management data

Reversing some of the underlying architecture helps the Spectrum distributed management platform keep track of more objects in its archive database. The changes will also enable efficient communication among servers in extended networks and improve reporting functions for those with small networks.

Cabletron is fixing database problems that have plagued users such as the U.S. Postal Service. The vendor is also enabling new reporting functions, such as output to World Wide Web servers for widespread access to management information.

But engineers crowded more time to ensure changes will work properly and won't affect existing applications

— hence the delay for Version 4.0.

At the heart of the new version is a patent-pending algorithm called trend-based reduction that removes much of the "air space" within management information, said Bill Tracy, engineering director for Spectrum Applications at Cabletron.

This information comes from devices that report using the standard Simple Network Management Protocol or Cabletron's own agent.

"We achieve a 30-to-40% compression ratio, yet application modules still collect data for the archive database the same way," Tracy said. "Version 4.0 Spectrum just combines steps to write it and send it across the network in compressed form. That saves time and overhead." —Patrick Dryden

Manageable upgrade

Version 4.0 of the Spectrum management platform will utilize new database technology to handle alarms and reports enterprise-wide instead of server by server. Cabletron plans to smooth the upgrade in the following three ways:

- Client/server mix**
The new GUI will let administrators view Version 3.0 servers.
- Database conversion**
A batch process being tested now will condense archived data to the format required by Version 4.0.
- Smart filters**
The interface for new multiple-server report functions recognizes and screens out Version 3.0.

operating before his busy season in December, said Don McPhillips, telecommunications program manager.

"Now I hope to have them running together by the end of January with at least a beta version," McPhillips said. "Their beta software we've run in the past has been almost good enough for production

Wall Data opens PC door to legacy data

By Craig Stedman

Wall Data, Inc. plans to soon ship software that should make it easier and cheaper for PC users to tap into the huge volumes of mainframe data stored in old-fashioned flat files, according to sources.

The software should ship in the fourth quarter, the sources said.

In its database access product, Wall Data is building support for directly extracting information from IBM's VSAM flat file software via the widely used Open Database Connectivity (ODBC) specification. ODBC, developed by Microsoft Corp., is an application program-

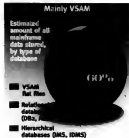
interface that allows desktop users to access different vendors' databases. "Even today, the biggest common denominator is a mainframe with VSAM, CICS and Cobol, whether anybody wants to admit that or not."

However, getting at VSAM data from a PC can be cumbersome and costly, Atré

said. It typically requires gateway software made by vendors such as Sybase, Inc.'s MDI unit and Information Builders, Inc. Those products can cost \$1,500 or more per user, while ODBC drivers such as Wall Data's usually cost \$200 to \$300 per user, she said.

William Skirball, database product

manager at Wall Data in Kirkland, Wash., wouldn't comment specifically on the vendor's plans. But he confirmed that the company late this year will add VSAM support to its Rumba Data Access product, which provides access to mainframes and other IBM systems from within ODBC-compliant PC applications.



Source: Atré Associates, Inc., Fort Chester, N.Y.

ming interface that allows desktop users to access different vendors' databases.

Considered a de facto standard, ODBC is usually associated with relational databases. But IBM put a protocol that makes ODBC-to-flat-file linkages possible in the most recent version of its mainframe storage management software, and the sources said Wall Data is implementing the protocol in its ODBC driver.

Valuable antique

Predating even hierarchical mainframe databases such as IBM's IMS, VSAM simply puts data into a sequential file with limited indexing. In the relational age, VSAM "is getting pretty antiquated," said Paul Quade, director of capital planning and resource management at Galileo International in Englewood, Colo.

But moving applications off of VSAM is "a huge effort," Quade added. VSAM remains in heavy use as a result, and simplifying access for client/server users "is probably something worthwhile," he said. "There's a lot of [VSAM data] out there that's just very accessible."

Analysis said VSAM continues to hold more than half of all mainframe data. Banks and insurance companies are especially reliant on it, and VSAM-based applications are concentrated in life-hold transaction processing areas such as order entry, invoice processing, payroll and financials.

"Wherever there are IBM mainframes, there is usually VSAM," said Shashi Atré,

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Tandem, NEC combine forces for NT server

By Michael Goldberg

Enticed by the momentum of Microsoft Corp.'s Windows NT, Tandem Computers, Inc. and NEC Technologies, Inc. have teamed up to develop a fault-tolerant server with high data throughput based on Mips Technologies, Inc. chips.

TRADE YA	
WHAT EACH COMPANY GETS	
■ NEC	■ Tandem's high-availability software for its low-end servers
■ A fault-tolerant server jointly developed with Tandem	■ Tandem's ServerNet technology for the jointly developed server
■ TANDER	■ Marketing of NEC's Mips-based workstations and PC servers running on Windows NT
■ NEC's experience with Windows NT	■ A customer for its new ServerNet technology and the chance to incorporate the technology into a system using Windows NT

Officials plan to announce the pact Sept. 5.

Spokesmen said they would bring out a new Windows NT server running on Mips R10,000 microprocessors in mid-1996. Under the agreement, Tandem will sell NEC's RISC workstations and servers, and NEC will use Tandem's high-availability software.

The servers will be available in models that promise high availability or for a higher price, fault tolerance, the companies said.

The computers also will incorporate Tandem's ServerNet technology, which uses 300M byte/sec. router hardware and software to move data among computers, communications controllers and peripherals. The ServerNet architecture acts as an express train for data that doesn't need to be processed by a CPU [CWI, July 3]. Cupertino, Calif.-based Tandem also plans to release systems using ServerNet that also run on Unix and its NonStop Kernel operating systems next year.

Observers said the NEC/Tandem deal makes sense as the firms move to embrace Windows NT. Tandem, a player for 20 years in

large systems, can offer a broader range of products with NEC's workstations and servers. Mountain View, Calif.-based NEC, meanwhile, gains Tandem's expertise in highly available systems.

"It's a good thing for Tandem to be successful as a supplier, they need [more] strength in open systems," which NT does, said analyst Richard Winter, president of Winter Corp. in Cambridge, Mass.

Ups and downs

Ted Julian, editor of "The Gray Sheet," a PC market newsletter in Framingham, Mass., and teaming up with Tandem allows NEC to produce servers with higher profit margins than are available in the current desktop world.

For low-end users looking at the deal, however, Julian said the companies' reliance on Mips' chips, which are developed by NEC, Silicon Graphics, Inc. and SGI's Mips Technologies division, poses a quandary.

"Users want to run software, and that's where this deal breaks down," Julian said. "NT will have lots of versions. It's [processor] independent. It's got to have optimized applications, and from a software developer's perspective, Mips is not first on their list." Processors by Intel Corp. and the PowerPC alliance of IBM and Apple Computer Inc. are likely to top that list, he said.

For users of Mips' technology, the Tandem/NEC deal has potential if the new servers come in at a reasonable price.

"My initial reaction to this is that it's terrific," said Jon Finkelstein, sales director at Micro Research Industries in Alexandria, Va. His company has set up about 60 NT-based client/server systems for members of Congress in Washington using NEC RISC servers.

Finkelstein said House members — of both parties — are constantly seeking better data throughput and less downtime from their systems. Each system usually serves about 15 Capitol Hill users and another 10 district office staffers and costs from \$60,000 to \$100,000 for servers, PCs, printers and peripherals, he said.

IBM's parallel system clustering technology is starting to come into full flower. See page 6.

News

Unix/Intel superserver on the way

By Jean H. Rozman

Chem Systems Corp. — the company founded by former Cray Research, Inc. supercomputer designer Steve Chen — will announce a superserver on Sept. 18, its industry sources said last week.

The machine — a symmetrical multiprocessor — has been in beta testing since June. The Unix-on-Intel server should provide better price/performance than Unix systems based on RISC processors from Sun Microsystems, Inc., IBM and Hewlett-Packard Co., analysts said.

The server will run Novell, Inc. UnixWare 2.0 and Oracle Corp.'s Oracle7 database and

will scale to eight Intel Corp. Pentium CPUs. Future versions will support more CPUs and can be clustered together, sources said.

Chem executives said the systems will range in price from roughly \$75,000 to more than \$150,000.

Symmetrical multiprocessors

The system is geared to run databases at high speeds and will be demonstrated at Unix Expo '96 in New York and the International Oracle Users group meeting in Philadelphia later this month, sources said. It was designed to be a client/server engine for applications that link to mainframes and PC networks. Target users will include data warehouse, multimedia/video server and decision-support applications.

Industry analysts expect Novell to help promote the system in an attempt to boost volume for its UnixWare 2.0 server software. Novell sold about 70,000 copies of the software last year. Larry Lytle, chief executive officer of the UnixWare Technology Group in Florham Park, N.J., said the Chen machine is on the high end of performance for UnixWare 2.0 systems.

Chem Systems "is building a scalable commodity-based server," said Scott Winkler, an analyst at Gartner Group, Inc. in Stamford, Conn. "You can look at it as a competitor" to Tricord Systems, Inc. Tricord's Intel-based machine runs the Santa Cruz Operation's SCO Unix.

A bird's-eye view of large nets

By Bob Wallace

■ Frontier Software Development, Inc. last week announced what analysts say is the industry's most powerful network visualization tool: a package that lets users keep an eye on their LAN internetworks and troubleshoot problems.

Network Expert Visualizer is the first major offering to provide network operations statistics up to the application layer using various parameters as opposed to tracking network use and trends by device addresses.

The Unix-based package enables users to visualize, isolate and characterize network traffic conditions and problems. It creates graphical, logical and physical views for specific topologies, traffic types and devices.

The visualizer can display up to 500 LAN segments, while some competing products can display only 12.

Specifically, the package lets users isolate portions of their network by selecting LAN segments — topologies such as Ethernet, Token Ring and Fiber Distributed Data Interface — and domains, including IP, Digital Equipment Corp.'s DECnet and Novell, Inc.'s NetWare. They can also isolate subjects by protocol and host.

This lets users zoom in on selected portions of the network by zipping screen objects based on parameters such as collisions, network use, packet broadcast rates and errors.

"It's a fast and quick tool that provides a real-

time graphical representation of host traffic and application-specific traffic from end to end," said a network manager at a major New York financial services company that is evaluating the product.

"It gives you a top-down view of all nodes in your network as well as the volume of traffic between them," said the manager, who requested anonymity.

Higher layer data is available by supporting Remote Monitoring & (Rmon), a fast-emerging specification that will provide a standard for collecting more useful network usage and performance data.

"Rmon gives users the ability for the first time to monitor information such as top talkers, traffic transmitted and error packets on LAN segments by protocol, as opposed to doing that by IP media access control address," said Andy

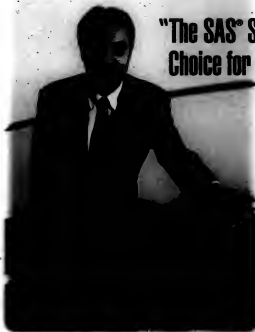
Bierman, chairman of the group working to make Rmon a standard.

Analysis lauded the product. "Frontier is out front with Rmon2 support, which is a key differentiator, though possibly not for long because others are working hard to adhere to the spec," said Michael McConnell at McConnell Consulting in Laguna Beach, Calif. "And [Frontier] is the first with 3-D capability, which makes monitoring the network easier."

Network Expert Visualizer, which can run on Sun Microsystems, Inc. SPARCstations, Hewlett-Packard Co. 9000 and 9005s and IBM RS/6000 Unix systems, will ship by month's end for \$4,995. Frontier is in Chelmsford, Mass.



Network Expert Visualizer provides network operations statistics up to the application layer.



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They're finding answers in the SAS System, which enables over 70 financial analysts to advise portfolio managers on the best portfolio mix. "Our strategy is to find ways to enable analysts and financial advisors to handle information more easily and quickly," says UBS Vice President Beat Moser. "What that meant was finding a software tool that could eliminate the redundancy of information and time caused by the use of several different analysis products—each limited in terms of functionality and ability to access key data. And it meant finding a tool that allowed applications to be developed, and changed, fast."

Smart Move, Smart Money Moser believes that UBS has resolved those challenges in their choice of the SAS System as their strategic software. "Our previous system required many labor-intensive steps as data was moved from one software product to another," recalls Moser. "Today data access, management, and summarization is handled automatically by the SAS System. This has given us productivity gains of up to 200% in some areas. The SAS System is fully integrated and meets most of our analysis needs—it's our strategic choice in various research units of our bank."

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A few unprovoked remarks about UNIFACE application-building strongware from Reggy "Chainsaw" Morgan, social secretary of Client/Server Angels International, West Covina Chapter.



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WHAT THE BIG GUYS USE

Microsoft pulls oars out of workflow waters

Company will roll out MAPI extensions but let standards group steer

By Tim Ouellette

While Microsoft Corp. likes to make itself the standard in other areas of the computer industry, the Redmond, Wash., giant seems willing to go with the flow

in the workflow market.

Specifically, workflow extensions to its Messaging Application Programming Interface (MAPI) will be Microsoft's only workflow effort. That will effectively leave the rest of the workflow standards

issue up to the 80-member Workflow Management Coalition (see chart). And the MAPI extensions won't be done specifically with Wang Laboratories, Inc., as some in the market feared.

"We are not going to do any other work-

flow API," said Steve Silverberg, product manager at Microsoft's Exchange Server product unit. "The only relationship we have with Wang on workflow is that they have a marketing relationship as a preferred vendor."

Wang, which will provide an image viewer with future versions of Microsoft's Windows 95, had talked of developing workflow APIs with Microsoft.

One powerful user group aims to make sure Microsoft will not revert to strengthening the market into going its way. The Black Forest Group—a mostly European user organization made up of giant firms such as General Motors Corp., Nestle S.A., Shell Oil Co. and British Airways—has written to Microsoft, asking the company to take a different approach than usual with the workflow standards and permit the development of a real standard.

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Directing the flow

The Workflow Management Coalition is working on the following interfaces:

Workflow Client API (by year's end)
Client can connect a workflow client application to different workflow servers with a graphical interface

Process API (after 1995)
Process maps designed in one workflow product can run in another

Task Invocation API (after 1995)
Workflow-enabled business applications can be called directly from the workflow engine

Product Interoperability API, Status and Management API (after 1995)
Workflow engines share a process and can be managed by different scheduling applications

The group wanted to ensure that there is no overlap between Microsoft's MAPI extensions and efforts of the Workflow Management Coalition, said Pat Hickey, chairman of the Black Forest Group.

Workflow systems, which automatically route work items through an organization and monitor the progress of the work, have left users confused in many cases because of the lack of standards among competing products. Users can't communicate between production and message-based workflow systems very well, for example, or have one client application use various workflow engines.

The MAPI extensions provide a framework for workflow systems to communicate with MAPI-based messaging systems, Silverberg said. Most low-end workflow systems use messaging systems, some based on MAPI, to route work items. High-volume, production workflow isn't messaging-based.

The coalition is preparing an API that will let users of one workflow client application hook into various workflow engines. "A lot of people like to polarize it when Microsoft gets involved," but users won't have to choose between the two standards, said Thomas Koulopoulos, president of Delphi Consulting Group, Inc. in Boston and a coalition member.

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THE INFORMATION MANAGEMENT COMPANY

HP preps for Unix, PC convergence

Company taps veteran executive to run all computer business units

By Jean S. Bozman and Michael Goldberg
PALO ALTO, CALIF.

Hewlett-Packard Co. brought in a new coach last week to urge on its corporate business units as they integrate the Unix and PC machines that will share a com-

mon chip architecture by 1998.

The firm named Richard Belluzzo, 41, executive vice president in charge of all HP computer businesses. His last job was overseeing the company's successful lines of business in laser-jet printers and PCs. Belluzzo is expected to

stress retail sales and product convergence as touchstones of HP's push to grow beyond \$25 billion in sales.

Belluzzo and five other executives will report directly to HP Chief Executive Officer Lewis Platt. Computer Systems Organization general manager Win Roe-

landis, who manages HP's Unix server and Unix workstation businesses, had reported to Platt but will now report to Belluzzo.

The move combines PCs, printers, Unix workstations and Unix servers along with HP's distribution channels and sales forces. But users don't expect the consolidation to result in any near-term changes in products or direct sales.

"I'd be really surprised if I saw any near-term chaos," said Paul Hoedeman, chief information officer at \$5 billion AlliedSignal Aerospace in Turrence, Calif. "One of the things HP has been trying to do is act like one company, and this may be a step in that direction." Hoedeman has been talking to HP about buying PCs to broaden AlliedSignal's corporate purchasing contract for HP's Unix systems.

Longtime users at large sites said they don't want direct sales to take a backseat to reseller sales, which are the foundation for HP's success in printers and PCs.

Users still expect HP sales representatives to provide product information and resolve problems, a recent Intertec user group survey showed.

But HP may be hoping Belluzzo can apply his cost-cutting skills to high-priced computer systems.

But Ron Seybold, president of "The 3000 News Wire" in Austin, Texas, a newsletter about HP's proprietary HP 3000 servers, "If [Belluzzo] can help [it] maintain a reasonable margin on the production of these Unix-based systems, HP will be able to afford to drop prices."

Belluzzo's promotion is a harbinger of the convergence of PC and Unix systems on a single HP/Intel Corp. architecture, said David Wright, information systems project manager at Tufts Associated Health Plans in Waltham, Mass., which uses HP 3000s.

Belluzzo said he plans to have HP's direct sales force continue to deal with customers, but some PC-related shipments to large sites will be off-loaded to resellers to save on costs. "Big corporate customers are looking for a supplier who can approach the PC market more as an enterprise supplier," he explained last week. "We'll have a challenge to do that in a cost-competitive way."

The new man in charge of \$20 billion in HP computer business is steeped in the "HP Way" corporate culture. He began working at the company 20 years ago, straight out of San Francisco's Golden Gate University, where he studied accounting. "He has a track record of being able to make the right decision and to grow things rapidly," said Tom Willmott, a vice president at Aberdeen Group, Inc. in Boston.



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NetWare tools rein in big networks

By Patrick Dryden

NetWare LAN administrators will get help managing extended networks with three tools that debut this week from BindView Development Corp.

Formerly known as LAN Support Group, Inc., the Houston-based vendor's software is taking on an enterprise edge to handle more servers, stations and users.

Versions of the namesake analysis and audit program now scale across extended Novell, Inc. NetWare 2.x and 3.x networks and bring new manageability to the NetWare Directory Services (NDS) of NetWare 4.x environments. Password Sentry, a new security option, helps protect the passwords of thousands of users.

Wide range of modules

Beta tester Jeremy Dumota praised the distributed management enhancements to BindView Network Control System in Version 3.6, which he evaluated for use with 45 NetWare servers on a global network.

"With this modularity of BindView NCS, administrators can run NetWare analysis reports at their locations, and we can get a view of the entire network," said Dumota, a systems analyst at Torrington Co., a manufacturer of bearings and automotive products in Torrington, Conn.

Hierarchical communication enables Version 3.6 to distribute management functions across multi-server networks and eliminate duplicate logs that supervisors had to reconcile manually, according to Eric Pulsaki,

president of BindView Development.

On Torrington's network, Dumota was able to designate one NetWare server as each site's an auditor. When users logged in, other servers would route data about stations to the auditor. "This structure is more efficient and easier to administer, and enterprise reporting functions let us build one big report on all stations and servers," Dumota explained.

Central administrators also can manage files on far-flung NetWare servers from the console of BindView 3.6.

OUT OF A BIND

The following are new and upgraded NetWare management tools from BindView:

PRODUCT	DESCRIPTION	ENHANCEMENTS	PRICE
Version 3.6 BindView Network Control System (Nagios)	Analysis and reporting tool for managing servers and workstations on NetWare 2.x and 3.x	Distributed management; improved security	\$295 (console); \$595 (per server); \$695 per 100 nodes for station module
BindView for NDS (New)	Analysis and reporting tool for managing NetWare Directory Services (NDS) of NetWare 4.x	Browses visible and invisible objects in NDS database; creates custom baseline and security audit reports	\$495 (console); \$595 (server) (license)
Password Sentry (New)	Security analysis tool for NetWare 3.x	NetWare Loadable Module screens user passwords against databases to check for common or obvious words	\$495 (per server)

Pulsaki said. They can remotely update software through file distribution functions, execute commands and purge files on one or more NetWare servers.

Similar capabilities extend to NetWare 4.x networks with new BindView for NDS. Unlike tools that examine the NDS database off-line or examine individual objects on a tree structure, this console provides a live analysis tool and complete report generator.

"This long-awaited tool is absolutely unique," said Michael Compton, information technology security services manager at the Detroit office of Coopers & Lybrand.

"My clients with production NetWare 4 networks can't document what their NDS tree looks like," Compton said. "With other tools, they can figure out one object at a time, but some objects still can be hidden. BindView for NDS gives us the whole context and allows customized reports."

A new NetWare Loadable Module that links to BindView consoles can help supervisors screen out bad and easily guessed user passwords. It can also deny user attempts to choose unacceptable passwords.

Password Sentry provides a scanning engine that compares passwords with databases of generic and specialty terms—from the legal and medical fields, for example. It also adds password security features from Microsoft Corp.'s Windows NT, so NetWare users can't reuse old passwords or make changes too frequently.



NetWare users close in on universal mailbox. See page 41.

Firm targets VAX users

By Craig Siedman

Call it Ken Olsen's revenge.

Advanced Modular Systems, Inc., a small Acton, Mass., company that features the legendary minicomputer pioneer as its chairman, has developed a multipoint server unit IBM will use to try to pry customers away from Digital Equipment Corp. Open found-

engine running OpenVMS.

The 7996 is targeted at VAX users who want to add support for workstation and PC applications or start moving away from the Digital platform into the Unix world. IBM initially is focusing on manufacturing customers but will later expand into other markets, such as financial services and publishing, said Lyn Boston, president of Advanced Modular.

IBM's plan to provide such a direct alternative to VAX customers "is a real trip," especially with Olsen's involvement, said Robert Coninger, data processing manager at OK Industries, Inc. The Port Smith, Ark., poultry processor is a longtime VAX user.

Supporting multiple platforms in a single box is "a fascinating concept," Coninger added. A built-in migration path to IBM's AIX derivative of Unix "opens up a different approach to the problem" of where VAX users should go next, he said.

The modular server idea originated at Digital and was a pet project of Olsen's during his last few years at the company. The project was later dropped, and members of the development team left to form Advanced Modular in late 1992.

PaperClip changes image

By Tim Ouellette

Now there is another use for the ever-present paper clip.

PaperClip Imaging Software, Inc.'s PaperClip for Windows Version 3.2, released this week, will enable users to manage their documents and images on Microsoft Corp.'s Windows NT Server.

The Hackensack, N.J., company is also improving storage integration by bundling a three-user network version of its software with Meridian Data, Inc.'s CD-ROM networking products.

PaperClip software organizes related images, messages, faxes and software files in a folder structure for users on PC LANs. For references, users can clip the image to an application they are working on. Enhancements include improved batch indexing, an auto import facility and optimized searching. According to one reseller, reliability is also a strong feature of PaperClip's systems.

"It is very well behaved," said Glenn Leonard, president of InfoTek, a value-added reseller in Knoxville, Tenn., that has installed 12 PaperClip systems. "I don't know when I have had a 'down system' clip related to the software."

The typical PaperClip installation starts off in the five- to 10-user range, he said, and can be built up to about 100 concurrent users. And be-

cause the software is application independent, users can review documents in PaperClip by hotkeying from any application.

"Users can hot key from their Unix payroll application and get the person's folder and a short list of what's in there," said Joe Turner, MES director for the city of New Britain, Conn.

Turner said the city, with about 2,500 employees, uses PaperClip to maintain payroll information stretching back nine years. The cost of setting up the imaging system with PaperClip was less expensive than using other packages, he noted. Most of the money was spent on scanners and jukeboxes instead of software.

PaperClip uses its own "clipping" feature instead of technology such as Microsoft's OLE, which is used by competitors such as Watermark Software, Inc. and Diamond Head Software, Inc., said Karen Shegda, an analyst at DataPro Systems Services Group in Deleware, N.J. OLE lets users launch applications from within other OLE-compatible applications. Having its own clipping feature allows more application independence because PaperClip isn't restricted to working with OLE-compatible software, Shegda added. PaperClip 3.2 costs \$285 for a single user or \$4,995 for a five-user network edition.



New VAX hospital operates without paper. See page 41.



Advanced Modular's new chairman, Ken Olsen, will help IBM go head-to-head with Digital, the company he founded.

ed Digital in 1987 and ran it until he was dropped by the board of directors three years ago.

IBM introduced the Advanced Modular machine last week as its 7996 Cross-Platform Server. The system has a base PC server module that can be augmented with separate add-on units that include an IBM RS/6000 VAX processor and a Digital VAX

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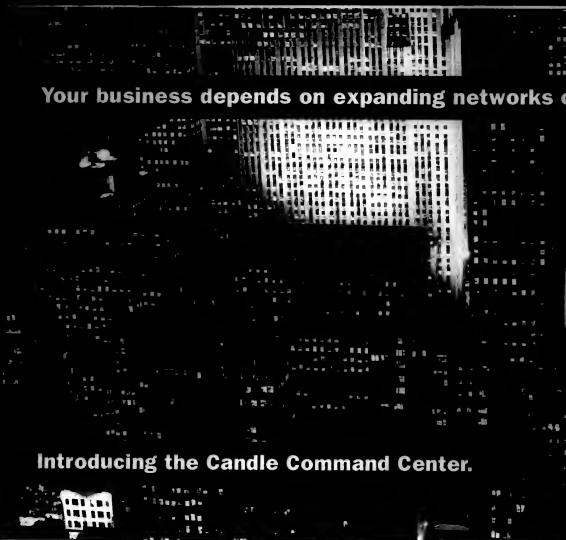
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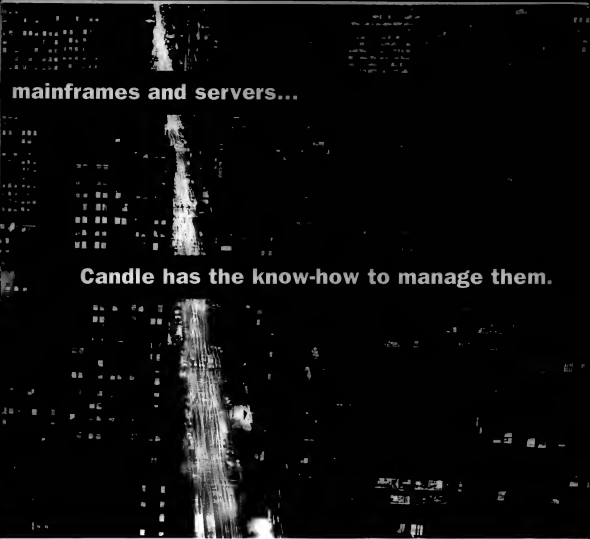
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Computer Industry

Trying times

Tricord exits PC server market in bid to curb losses

By Jinkman Vijayan

Superserver vendor Tricord Systems, Inc. is having anything but a super time these days.

Hammered by steeply mounting losses caused mainly by an abrupt move into the mainstream PC server business, \$81 million Tricord has initiated a series of far-reaching measures aimed at pulling the company out of its financial tailspin.

In May, the Plymouth, Minn., company appointed John Mitcham, former president of AT&T Paradyne Corp., as chief executive officer and president. Mitcham took over for now-retired John Edwards.

Since his appointment, Mitcham has initiated the following:

- In late May, the company announced it would completely pull out of the high-margin, but brutally competitive, PC server business, which it had entered less than five months earlier. The company will support existing installations. The withdrawal will cost the company a one-time \$18 million charge associated with the disposal and write-down of obsolete and excess PC server inventory this quarter. This charge was a major contributor to a second-quarter loss of more than \$25 million on revenue of \$16.7 million for the quarter ended July 30.

- An almost total paring of the company's product lines. In addition to dropping all of its departmental PC servers, the company is consolidating its entire PowerFrame enterprise server family into just one modular server offering that can be configured several ways. It will, however, continue to support all existing models and configurations.

- A scaling down of operating system support. The company will no longer offer Unix, OS/2 or Banyan Systems, Inc.'s Vines support. Instead, it will focus only on Novell, Inc.'s NetWare and Microsoft Corp.'s Windows NT environments. It will continue to support current customer installations.

- A comprehensive downsizing of Tricord's channel partners. Tricord reduced a group of more than 200 resellers

nationwide to approximately 50.

- A move from build-to-inventory manufacturing to build-to-order manufacturing to reduce the number of system mod-



Source: International Data Corp., Framingham, Mass.

els and keep down inventory of finished goods.

The decision to get into the general lower-end PC server business and the subsequent pullout is a major impetus behind the mounting losses and restructuring, said Jan Mackay, vice president of marketing at Tricord. "We got deluged by our decision to get into the PC server business. It was just too much for us to try to do," he said.

By concentrating on offering only enterprise-class server configurations in NetWare and NT environments, the company hopes to bring its focus back to its core business and customers, Mackay said. Most of the company's current installations are in these environments.

Another outcome of this renewed enterprise focus will be the building of key partnerships with independent software vendors and channel partners in vertical application areas. Through these partnerships, Tricord will increasingly offer highly integrated and bundled server products.

"Tricord sort of just ran out of juice and basically got themselves a bit confused over the last 18 months or so," said Steve Triggs, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

Radius' woes proliferate, 'significant' loss expected

By Lisa Picardie

Trouble appears to be radiating throughout Radius, Inc., a struggling Sunnyvale, Calif., Macintosh clone maker. And according to analysts, it shows no signs of dissipating any time soon.

On the heels of a major executive shake-up, Radius last week compounded its woes by revealing it will report a significant loss for its fourth quarter, which ends Sept. 30. The clone maker declined to provide further details on what will be its fifth consecutive quarterly loss.

Even more worrisome, the company is having trouble getting its products out the door in volume—even with IBM as a manufacturing partner.

"We are about 30 days behind where we thought we would be," said Chief Executive Officer Chuck Berger. "Right now, the biggest obstacles are largely due to delays with IBM building the volumes necessary."

Difficult recovery

Some analysts already predict Radius will have a hard time recovering from this delay. They further predict that Radius' position as a major Macintosh developer and clone maker may negatively affect Apple Computer, Inc.'s ability to attract more developers to the platform.

The negative financial news coincides with the recent departures of two key executives—Robert Saltmarsh, chief financial officer, and Rick Schrammek, vice president of Radius' systems division—both of whom resigned to pursue other interests.

Berger said both resignations were amicable and not related to the company's financial situation. However, according to sources inside Radius, Salt-

marsh was spending more than half his time trying to raise cash for the company. Saltmarsh helped secure a private placement of \$25 million last quarter.

Observers noted that having to get a private placement rather than doing a second public offering is indicative of a struggling company.

Dennis Dunnigan, former CFO of Chips and Technologies, Inc., was named Radius CFO and vice president of finance two weeks ago. Matthew Medeiros, Radius' vice president of operation, replaced

Schrammek, who was brought on board a year ago to start Radius' systems business. To date, the company is shipping, albeit in limited volumes, a high-end Power Macintosh clone and a general-purpose Power Macintosh machine.

"What we need most now is good blocking and tackling in finance, and Dunnigan's whole background is managing costs and inventory," Berger said. He said plans to "significantly reduce operations costs" are under way. He declined to comment on whether Radius will lay off any workers.

The bulk of Radius' problem, according to Radius insiders and some observers, stems from a "strategy de jour." Most suggested the company, which makes a host of graphics-oriented products and most recently decided to license the Mac OS and become a Macintosh clone vendor, isn't focused.

"The company has way too many things on its plate," said a former Radius executive who asked not to be identified. "They had barely gotten through the merger with SuperMac, and they jumped into the Mac compatibility business."

Sources close to the firm said 1994's merger with rival SuperMac caused cash flow problems that continue today.



Radius CEO Chuck Berger says plans to reduce operations costs are under way.

Radius' financial results

Quarter ended	Revenue	Income
Dec. 31, 1993	\$19.1M	\$4.13M
Dec. 31, 1994	\$23.12M	\$292,000
March 31, 1994	\$22.1M	\$2.92M
March 31, 1995	\$66.17M	\$3.14M
June 30, 1994	\$16.7M	\$1.49M
June 30, 1995	\$11.3M	\$-5.63M





Client/Server Applications in the Distributed Enterprise

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The Enterprising Enterprise

Companies are beginning to use database technology to boldly go where no database has gone before. What kind of information architecture do they need to explore brave new worlds?

BY DENNIS McEVoy

Vice President of Products, Sybase, Inc.



REMEMBER the good old days? When product life cycles were measured in years? When you had time to think and plan? In 1993, the globe is a lot smaller, and time is a lot shorter. In today's hyper-competitive marketplace, it's not uncommon for products to move from drawing board to shrink-wrap in less than 12 months.

Thus acceleration is placing enormous pressures on information systems professionals, who are increasingly under the gun to produce applications in as little as three months that support evolving business processes and requirements. You're also expected to perform miraculous feats, deploy mission-critical applications on every computing platform under the sun, and bring real-time data to every desktop in the company.

The competition will stop at nothing to serve their customers faster and better. Which means that you'll need to come up with ingenious ways of helping employees be creative and productive.

Anytime, anywhere computing

Cutting-edge companies recognize that data can be used proactively, to help predict business trends and seize new opportunities. Data needs

to be current, accurate and synchronized in order to support seamless and up-to-the-minute business operations. This places new demands on information systems.

Online transaction processing (OLTP) systems — the workhorse operational business systems — are being pushed to new heights. For example, AT&T's Directory Assistance needs to distribute over 300,000 updates per day to its call centers throughout the country, while maintaining 100% uptime and near real-time status of all customer information.

Beyond OLTP, companies are looking for simpler and more meaningful ways to interpret data. For example, Blue Cross of California has

built a data warehouse to improve actuarial analysis of stored information to make better pricing, product development and marketing decisions.

Companies also want to put key information in the hands of large numbers of remote users...no matter when, no matter where. Metro Goldwyn Mayer, for example, has automated its sales force with notebook computers and CD-ROMs that contain an en-

Because of the variety.

of applications and

uses, there's no

"one-size-fits-all"

technology solution

that can meet all

your computing

requirements.

Distributed Enterprise Requirements

	OLTP Mixed Workload	Data Warehouse DSS	Mass Deployment
Database	Price/Performance Scalability Availability	Planned and unplanned queries Scalability Price/performance	Small footprint Low cost Easy-to-use Self-tuning
Middleware	Heterogeneous high speed replication High speed gateways	Mainframe integration Transparent access to all data	Mobile Messaging
Tools	Industrial strength Multiple skill sets Multiple databases	Easy-to-use Access to multiple data sources	Easy-to-build Easy-to-use

The technological requirements for today's distributed enterprise are placing enormous new pressures on IS professionals.

tire inventory of film clips they can demonstrate. Other examples of anytime, anywhere computing abound. A large oil company is connecting its databases to gas tanks so that the company can fill the tanks before the service station makes a telephone call. A greeting card company provides store kiosks so customers can write their own greeting cards, tapping into the company's verse database for inspiration.

Then there is the brave new world of electronic commerce made possible by the explosive growth of the Internet, the World Wide Web and electronic data interchange (EDI).

No one solution fits all

To implement applications that can deliver information to users in these new and diverse ways, what do you need? Because of the variety of applications and uses, there's no "one-size-fits-all" technology solution that can meet all your computing requirements.

To build applications that span your requirements from OLTP, to decision support, to nomadic computing, you'll need database technology, middleware products and tools that are each suited for a given task, yet fit together seamlessly.

For example, your company's pricing information is used in different ways. Marketing needs a high-performance advanced indexing database to analyze why a new pricing strategy is producing phenomenal results in the Midwest. Sales needs another database optimized for high throughput to produce price quotes in the field. Most database companies would not be able to address these different needs in a uniform way, so you'd be re-writing many applications to talk to each other. A set of modular but interoperable database, middleware and tools technologies will allow you to select the right tool for the right job, whether

you're automating a single business task or linking the entire enterprise.

Beyond the basics of OLTP

Information processing has moved beyond the capabilities of a simple database engine. Your database engines now need to handle different types of tasks simultaneously — high-speed transactions, query-intensive decision support, or batch reports. Is your database adaptable to varying workloads throughout the day?

Your OLTP systems need to span different departments and functions, so you'll need to be able to keep data up-to-date and in sync, even if some of your operational data resides on a DB2 mainframe system and other data is generated by PCs in branch offices. Are your gateways and interoperability products fast enough to keep up with the workload and able to neutralize the differences between different data types and hardware platforms?

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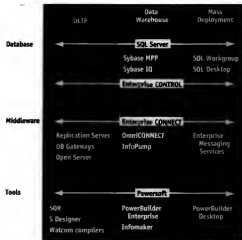
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Sybase's Enterprise Architecture



Sybase offers a modular and interoperable set of products to help today's distributed enterprise meet its requirements.

Spot trends and predict opportunities

Very large data warehouses are a different animal. These need to support complex, what-if questions interactively.

In this type of creative thinking process, you don't want to be limited in the way you access and manipulate data. Can your database index 100% of the data so that you can get answers quickly and easily? Does your database let you ask any question and get answers faster than a mainframe?

You'll also need to consolidate data from a number of different sources to populate your data warehouse. Do you have high-speed gateways that allow you to transfer data seamlessly to all your data sources, regardless of physical location or brand of database?

Extend your business

To put data in the hands of your customers, suppliers and field staff, you need to think about cost and ease of use. With mass deployment, the financial justification becomes cost per user rather than cost per transaction. You need a database that's so easy a novice can use it, small enough to fit onto a palmtop computer and priced low enough so you can empower tens of thousands of people with realtime information. Does your database do all of this, without a DBA?

Consider the challenge of getting data to and from the far reaches of the globe. You'll probably be using wireless or satellite networks, which means you may not be able to rely on a continuous, error-free connection between your host systems and nomadic users. Does your middleware handle both session-based and message-based computing?

Tools to pull it all together

To develop the right systems for these widely differing requirements, you will want to be able to use a set of tools that leverage your staff's

skills across all your systems. A standardized set of rapid application development tools that are simple enough for a power user and yet sophisticated enough for mission-critical systems will help you implement your applications more quickly.

Conclusion

By implementing technologies that operate independently as well as interdependently, IT professionals can address the end-to-end needs of the organization. With careful planning and the right technological foundation, corporations can look forward to a future in which their suppliers, customers and users can work together in an "anytime, anywhere" computing universe.

Client/server applications: requirements, solutions and alliances

BY HENRY MORRIS

Research Manager, Vertical Applications Research, International Data Corp.

ENTERPRISE client/server applications represent one of the fastest-growing of all software markets. IDC measures the total market in 1994 for enterprise client/server applications (including accounting, manufacturing, human resources and distribution) at \$1.923 billion, which represented a 78% growth rate over 1993. Sales include purchases of applications in a single functional area (such as accounting) or integrated suites of business applications spanning multiple business functions (such as accounting, human resources and distribution).

This dramatic increase in demand shows the growing acceptance of client/server as the architecture for delivering applications that automate operations critical to the enterprise.

What accounts for this trend? Why are organizations moving to enterprise client/server applications? IDC surveys have consistently shown two factors to be most significant:

End-user data access:

Business users demand direct access to information in order to make better decisions and to uncover new business opportunities. In a 1994 IDC survey, 15 managers identified four prior-

ity areas for data access: accounting and finance, marketing and sales, customer service and manufacturing. Confirming this result, the highest sales for client/server applications are in these areas.

Business process change: Organizations are seeking to streamline key business processes. IDC surveys of business and IT leaders show that the three main objectives are: reducing the time to market for delivering new products, improving quality and providing better service to customers. There is a high correlation between organizations seeking business process change and those moving to a client/server architecture.

Requirements for implementation

Can organizations achieve these goals of improved end-user data access and business process change? There are demanding requirements for the new generation of enterprise client/server applications.

The first wave of client/server applications were smaller scale, departmental systems. In many cases, these systems automated processes that had not been automated previously, such as routing, tracking and distributing documents within a workgroup.

The new wave of client/server applications govern larger scale busi-

- Business users
- demand direct access
- to information in order
- to make better
- decisions and to
- uncover new business
- opportunities.

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business operations, such as accounting, sales and marketing, and manufacturing. Unlike the first wave, these processes, such as accounting and human resources, have long been automated. Organizations are migrating from older mainframe-based systems that do not provide the needed flexibility for supporting business process change and end-user data access. The new requirements for enterprise client/server applications include:

Scalability: These are core transactional applications. They must be robust, capable of scaling up to handle hundreds or even thousands of distributed users simultaneously updating a database. The applications must ensure good performance and continued data integrity as usage increases.

Support for Application Integration: Business process change implies the ability to define new processes that span formerly separate business functions. These processes cross major boundaries such as accounting and finance, sales and marketing, and manufacturing. However, existing applications typically were written to support the work of a single major functional area. Migrating to enterprise client/server requires the ability to link a new packaged

application with another package or with an existing custom-built application. Application packages will need to support external links using advanced middleware such as message queuing, remote procedure calls and object brokering.

Support for Data Integration: End-user data access requires an integrated view of separate application databases, in terms familiar to the business user. Data warehousing provides an opportunity to transform new and existing sources of data in accordance with a consistent data model. Enterprise client/server applications should directly support this transformation. New PC-based data access tools must then be mapped to data in the warehouse or to spe-

cialized multi-dimensional databases to provide a higher level business view for end users.

Alliances: the critical success factor

Successful implementation of enterprise client/server applications requires the integration of diverse technologies, including multiple application packages, operational and decision support databases, and data access tools. In fashioning a solution, organizations can purchase each part separately in the client/server marketplace. This freedom of choice for organizations to select elements of a solution from multiple suppliers has defined open client/server computing.

But the challenges and the range of skills and expertise required to build a solution from the raw building blocks are daunting. **No single organization, no matter how large, can resolve all the issues alone.** Partnering to put together a solution is the only viable alternative. Thus an organization's portfolio of partners or alliances becomes the critical success factor for implementing client/server.

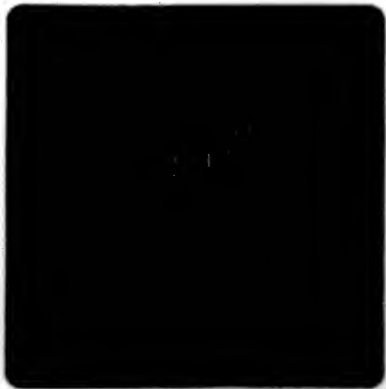
The application ecosystem

Just as organizations implementing client/server are realizing the significance of partners, suppliers of open client/server technology are recognizing the value of alliances. **No single supplier, no matter how large, can provide a total solution alone.** It is in the interests of client/server technology suppliers to form alliances so they can deliver more value to their customers.

This is good news for organizations, as they are increasingly able to purchase integrated combinations of applications and related software. These **integrated platforms** are created through alliances, either directly between software vendors or indirectly through VARs and systems integrators.

Application vendors have made their core applications competitive by building up functionality, moving to a client/server architecture and packaging applications as integrated suites. Now these vendors are looking for new ways to

In the future, a vendor's network of alliances, rather than its product investment, will become its major defense against potential competitors entering the market.



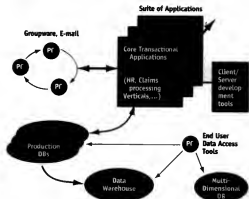
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The Application Ecosystem



The application ecosystem shows interdependence among core applications and several complementary software segments.

Source: IDC

The application ecosystem shows interdependence among core applications and several complementary software segments. Think of the application ecosystem as a model of potential software vendor-vendor relationships. Software vendors in the areas noted in the figure are dedicating greater resources to build alliances. In the future, a vendor's network of alliances, rather than its product investment, will become its major defense against potential competitors entering the market.

Applications and data warehousing are two points at which relationships in the application ecosystem converge, representing solution areas as that organizations look to buy. This reflects the fact that application vendors and data warehouse packages (such as database vendors) are driving the formation of networks of alliances. Vendors who can bring together related software products and technologies as **integrated platforms** and gain credibility as solution providers.

differentiate their applications for competitive advantage. They are partnering with vendors in software segments such as groupware, data warehousing and decision support tools for **value-added support**.

Groupware can be linked to core transactional applications to improve the way data is entered and the way information is distributed. Data warehousing and related decision support tools add value by improving end-user access to information.

Software vendors in areas complementary to applications, such as end-user data access, are looking to application vendors to be **additional channels of distribution** for their products. The combination of application vendors seeking added value and vendors of complementary software seeking channels is likely to result in more and more relationships being forged along these lines. These relationships form an **application ecosystem**, as shown in the figure at right

provide real added value to their customers' and gain credibility as solution providers.

Conclusion

Organizations implementing client/server are beginning to recognize the importance of alliances. In selecting a vendor, the quality and breadth of a vendor's network of alliances will be as important as the base technology delivered by the vendor.

Moving to enterprise client/server applications involves more than purchasing and installing a package. There are related software technologies that must be brought together to form a solution. As vendors take more responsibility for the integration of related client/server technologies, organizations have less complexity to deal with. Purchasing **integrated platforms** greatly improves an organization's chances for migrating to and implementing enterprise client/server applications successfully.

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Client/server applications in the distributed enterprise

Enterprise client/server applications can make the difference between surviving or thriving in today's rapidly changing business climate. But what kind of IT foundation do these packages need?

BY DAVID SOHM

Vice President of Channels and Partner Marketing, Sybase, Inc.



TODAY, the so-called "glass house" is more like a hothouse. Business is brutal. In many markets, how well a company does depends on how intelligently it deploys information technology.

Many leading-edge businesses are using information technology to get closer to their customer — understand customer requirements, design better products, get to market faster. These companies are deploying a new generation of enterprise client/server applications that enable the new, more effective cross-department business processes by delivering information to the right person, at the right place, at the right time.

Enterprise applications can help employees make the most of a company's information assets. But to do so, these applications must utilize the full power of the underlying technology to access, move, and manage information. There are three attributes to look for when selecting a human resources, accounting, or manufacturing application. Can it distribute data to key people in your business regardless of location? Does it integrate departments in collaborative ways of working? Is it flexible in meeting your unique and changing business requirements?

More data to more people

Distributed applications provide more people access to more data. Traditionally, data has been sequestered within departments, taking

data in but rarely giving it back in the form of useful information. For instance, do you ever feel like you work for the accounting department, feeding their systems in ways that make sense to them, but not to you? The new generation of distributed financial software packages makes it possible for a company's decision makers at all levels to get the financial information they need to make better business decisions.

Bridges between departments

Integrated applications streamline business processes between departments. At one level, this can reduce errors and costs by eliminating duplicated efforts. At a more strategic level, it can enable proactive business activities through well-placed, timely and useful information. In manufacturing, for example, by linking order entry with the manufacturing resource planning functions, companies can automate purchasing to minimize inventory costs.

Flexible applications = flexible business

U.S. companies spent nearly \$32 billion on changing their business processes in 1994, with varying results. Most companies now recognize the value of evolutionary (versus revolutionary) change. Flexible enterprise applications let you to change as your business changes. They let you select the best application modules for new business functions knowing they will work with the systems you

have, without rewriting vast amounts of code, converting tons of legacy data, or junking incompatible hardware.

Selecting the right foundation

You want superior application functionality to help run your HR, accounting, or manufacturing departments, but you also want to link these departments in new, decentralized but collaborative ways of working. This requires two sets of criteria for evaluating enterprise client/server applications, the functional checklist that guides your choice of applications, and the capabilities you'll need from the underlying client/server technology. Consider the following when evaluating a client/server foundation:

Distribute and synchronize data. The ability to replicate data throughout multiple sites is critical in large, diverse or global organizations. Are the replication features of your client/server software robust enough to allow transaction-level updates across the network to and from most popular databases? Is it robust enough to quickly accommodate new users and new business conditions without rewriting the application logic? Will it recover automatically when (not if) the network fails?

Connect with mobile users in faraway places. With more of your users and customers relying on mobile devices, you'll need to consider how to distribute data in an "occasionally connected" network. Is your client/server framework going to support message-based information retrieval and data replication without requiring any re-work of your applications?

Access to legacy data. It's a fact: 70% of corporate data is still stored in mainframe databases. An organization moving to client/server can't expect to suddenly migrate years' worth of data to the new environment. Does your client/server framework provide open APIs, high performance gateways, and bi-directional read and write capability so that your applications can transparently incorporate all your legacy databases in a transaction-oriented business environment?

Support for team-based business processes.

New generation applications take the view that not only do you need good data, but you need to get it to the right people at the right time, according to how they actually work together. It sounds simple, but consider the technological implications of ensuring that as each business event changes the underlying data, other users can act immediately on this new information — even if they're a field rep accessing the system from a palmtop. Is the client/server technology flexible enough to let you make on-the-fly changes to automated work routing or business rules as you discover backlogs in the work-in-progress or make changes to your processes?

Mainframe-class security and systems management.

If the application is to be deployed across multiple departments throughout the enterprise, the need for security is paramount. Do both the application and the underlying client/server foundation work within your chosen management framework so you can manage the application within a unified environment?

Data warehousing. Companies in data intensive industries, like insurance or banking, can often be information poor. Does your client/server foundation provide you with indexing capabilities that let you ask what-if interactive questions quickly and easily, and open database gateways that let you pull data into your warehouse from any of your operational systems, regardless of physical location or data format?

Conclusion

By combining the proper distributed client/server architecture with best-in-class enterprise applications, organizations can not only improve departmental processes but fundamentally change the way they do business. This change can be accomplished gradually and safely if you choose a technology foundation that gives you open access to your existing systems, the ability to "plug in" new applications as your business needs evolve, and helps you distribute needed data to the far corners of your enterprise quickly and reliably.

Some See Client/Server Only As Technology...

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David Asker, author of *Managing Brand Equity*, to name a few. The agenda also includes senior executives from top industry companies, such as Hewlett-Packard, IBM, Microsoft, Compaq Computer Corporation, Wired Magazine, Xerox Corporation, Ziff-Davis Publishing, CMP Publications and International Data Group.

Seating is limited and a sell-out crowd is once again expected, so register early. Registration fees are

\$995 per person prior to September 15th and \$1,100 thereafter. To receive information about the IntelliQuest Brand Tech Forum or the IntelliQuest Science of Branding Report, call us. If you are a technology marketing executive who has responsibility for creating, managing and promoting your brand, you won't want to miss this year's Forum. Because in today's high tech markets, nothing burns worse than bad branding.

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Viewpoint

Not-so-funny money

"Certainly there are lots of things in life that money won't buy, but it's very funny. . . . Have you ever tried to buy them without money?"—Ogden Nash, 1933

This bit of literary irony was never more true than during the depths of the Great Depression. Today, money just isn't enough for the post-De Spock, give-it-all-to-me-and-give-it-to-me-now generations.

Which is unfortunate, because salaries for IS professionals just might be at the start of a steady climb that could run through the end of the century. Our 8th annual Salary Survey (see story, Cover I) contains evidence to support that. We went to more than 1,000 companies to get our data, which is clearly the most comprehensive IS salary data you'll find anywhere.

This theory of continued salary escalation is bolstered by other data we've been collecting on a widening gap between the demand for skilled IS professionals and the supply of them, at least in some IS disciplines.

Our data shows that IS salary increases are larger and growing more rapidly than those in other professional groups for which we obtained comparative U.S. government data.

Furthermore, as corporations attempt to ramp up more robust client/server applications and expand on distributing computing plans, the demand for the very limited number of skilled client/server professionals will exert considerable upward pressure on salaries. Have you tried pricing a Notes expert lately? How about an experienced NetWare manager or a relational database manager? Or a data warehouse architect?

Back in the early 1980s, IS salaries were rising at double-digit rates, but so was inflation, which often outpaced even aggressive raises. The IS salary increases we are seeing already outpace inflation, and I predict they will outpace them even more so in coming years.

Preparing for and coping with the inevitable salary crunch will become one of the toughest battles you'll fight. The truth is, you'll have to be extraordinarily creative to have even a chance of winning.

Bill Laberis

Bill Laberis, Editor in chief
Internet: bill_lab@com.com



Another view through the ceiling

In "The Silicon Ceiling" (CW, July 17), Anthony Fedanzo writes that until senior management changes its way of thinking, the door to the executive suite is shut to those with an IS background. While I agree that most senior management has not dealt with its own prejudice against IS, I remain convinced that IS executives themselves shoulder the burden of proving their business acumen.

Until IS executives can convince their peers that they know the business side and have something to contribute from the technology side, they will not be invited to the party. As one CEO explained it, a CEO will always get one invitation to meet a user, but unless he wins the user's confidence, he will not be asked a second time.

It has long been my counsel to IS

professionals that they broaden their backgrounds and credentials, not rely so much on their technical mastery, demonstrate a bottom-line contribution and focus on communicating with users and senior management. Only when enough CEOs demonstrate such business leadership will the overall impression of IS executives fundamentally change and shatter the silicon ceiling.

John J. Davis

John J. Davis & Associates, Inc.
New York

Anthony Fedanzo's view explains a good deal of why 68% of us would not consider appointing our senior IS person to a general management position.

First, we don't like whiners or people with a victim mentality.

Second, we prefer people who can see the larger corporate picture and communicate and work well with other functional areas. IS

people do this almost as well as lawyers, with some exceptions.

Third, we prefer people who have succeeded in prior undertakings. Success usually means that a project accomplished what it was supposed to accomplish. Excuses and blame-shifting are not cheerfully accepted at the top management level.

Fourth, we prefer people who can explain things without comments along the lines of "It's hard to explain unless you have some technical background."

And for every story Mr. Fedanzo knows about some bank that "test considerable market share because of [top management's] inability to deliver services to customers," CEOs can tell a story about information technology people who failed to explain something to people without technical backgrounds. Many of us also have pretty good stories about all the time, money and market share lost to bungled IS projects.

IS people will have a better shot at the top when they improve at delivering what they were hired to deliver and demonstrate the general management skills that are needed at the top.

The victim posture is more likely to lead to being "out sourced" than to promotion.

Richard M. Gordon
Atlanta
mrkgmp@comp2.com.edu

Computerworld welcomes comments from its readers. Letters should not exceed 200 words and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 991, 100 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (603) 875-8931. Internet: letten@com.com. Please include an address and phone number for verification.

Take your time

Your editorial, "On the edge" (CW, July 17), is hardly useful to your readers in understanding the importance of Microsoft's Windows 95.

We split business computing into personal vs. enterprise. No orders will go unshipped if the PC crashes or refuses to work. But enterprise computing is about the operation of the business. If the computer crashes or will not run, some operational thing goes undone.

If you are a business PC user,

think Macintosh or Windows. If you use a network and Windows is too unstable, think OS/2. If you are doing enterprise computing, think OS/2 or Windows NT.

It was too early to tell about Windows 95 as a replacement for PC users, but Windows, Windows NT and OS/2 all look several years to mature and stabilize. Don't rush. Test, test, test and then test some more.

For really need the features in Windows 95. Most are available elsewhere. The testing process will mail early users.

Max Rosenblatt
Lincoln, Mass.

Verbatim

FROM CONGRESSIONAL TESTIMONY BY EDWARD L. HUGHES, DIRECTOR OF REGULATOR STUDIES AT THE CATO INSTITUTE, WHO ARGUED FOR SHUTTING DOWN THE U.S. DEPARTMENT OF COMMERCE AND ITS TECHNOLOGY SERVICES:

"Federal bureaucrats have no unique abilities, better than those of private investors and entrepreneurs, to pick winning companies and technologies. It is not by virtue of their keen abilities to spot future market needs or their creative abilities for inventing new products and services that bureaucrats acquire power to disburse investment funds. It is by virtue of their ability to function well in a rule-based organization that is insulated from market forces or their ability to secure a political appointment. If anything, one should suspect that the capabilities that make for successful bureaucrats and politicians would make dull, incompetent entrepreneurs."

FROM CONGRESSIONAL TESTIMONY BY FRANK TURNER-HEIMER, A LAW PROFESSOR SPEAKING FOR THE ELECTRONIC PRIVACY INFORMATION CENTER, WHO DISCLOSED BANNING INTERNET CONTENT THAT COULD BE USED BY TERRORISTS:

"The information on explosives that is transmitted via the Internet exists prior to electronic transmission. It has a life separate from the method used to communicate it. That life may be in any number of forms, including a training manual for construction workers, a textbook for civil engineering students, or a general explanatory text on explosives in an encyclopedia. Attached to this statement is a copy of pages 279-285 of Volume 21 of the 1986 Encyclopedia Britannica. It reveals great detail on explosive manufacture, whether in many respects to the information disseminated for the Internet... including, on pages 279-285, a description of the ammonium nitrate and fuel oil mixture used in the Oklahoma City bombing."

Viewpoint

Ban on-line play at work? Don't!

Edward G. Prentice

With the increase in company usage of on-line services and the Internet, there's a growing debate on how to deal with the problem of employees who may be wasting company time and money by exploring cyberspace for non-business purposes.

The natural tendency in this situation is to look for ways to control the abuse. Typical responses include limiting the cyberspace link to as few employees as possible, installing only on-line features relevant to company needs or designating a single PC as the cyberspace link for the office (or at least a bank of PCs in an open area where managers can watch what is going on). Other approaches include demanding specific time records for on-line usage and setting specific time limits for work-related on-line usage.

But control may not always be the most effective response to a problem. The side effects of a control strategy will cost the company far more than wasted time and money. For example, employees will spend company time finding ways around the controls. The control-oriented "solutions" show a lack of management trust in the employees and their willingness to be responsible. The distrust creates morale problems, which lead to decreased productivity — exactly the opposite



Tight controls on employee cybersurfing will backfire, causing a drop in morale and innovation.

of what management wants.

How does your company view the employees? Are they part of the problem or could they be part of the solution? At one company, where each person had a directory for storing files on a large shared disk, a lot of space was being consumed by games. Many were renamed with work-related titles such as QSALES.DOC or PROJECT.TXT. Management recognized and honored the employees' need for some game time and, instead of trying to stop it, they simply created a publicly accessible games directory. The result was that multiple copies of the same file became one, unused games simply got deleted, and many people actually lost interest in the real game of trying to get away with something behind management's back. This led to a huge savings in disk space, increased trust in both directions and increased productivity.

Companies don't grow by controlling. They

grow by being creative and getting ideas ahead of their competition. If employees don't share a commitment to cost savings and productivity, then any management efforts to force that commitment will backfire in some way. Consider instead having a conversation with the employees that explains the issue, looks for alignment and asks the employees to take responsibility for finding a solution.

This starts to create ownership not only for the problems, but especially for the solutions the employees generate.

Instead of asking, "How do we fix this?" ask, "What conversation would have to take place in order to provide unlimited access to on-line services and have it improve productivity and reduce costs?"

Be careful not to ignore the original justification for the on-line connection. Having employees spend part of their day on-line may lead to better communication with customers, a better corporate presence on the Internet and, as a side effect, better morale.

In return for "letting go," management may be rewarded with unusual ideas and far better results than "control" would have generated.

Prentice is a principal at Onpurpose, Inc., a Brookline, N.H.-based human resources consulting firm. His Internet address is egp@onpurpose.com.

What a long, strange trip

Jerrold M. Grochow

I have a recurring dream: I'm driving along a long causeway leading to a bridge. I start over the bridge only to find that it isn't complete. The roadway becomes just a series of girders and supporting rods. After a while, the girders stop and only the supporting rods are left, but still I drive on. A while later I can see where the rods end. In the distance, I see mist. I can't tell what's on the other side, but suddenly I hear the sirens calling. Then, I wake up.

I think I can save myself a trip to the psychiatrist and interpret this one myself. Over the past several months, I've been involved in several client/server projects — projects where clients want to know the answer. They want to know the best strategy for improved performance, flexibility and maintainability. They want to know the best approach to client/server development under all circumstances. They want to know that the multiple pieces of the client/server puzzle all fit together. They want to know that they can get from their mainframe system strategy to a client/server system strategy without navigating through this maze.

Unfortunately, I haven't been a very good consultant (by some measures). I haven't been telling our clients what they want to hear. In-



The trek into the client/server zone is only worthwhile if there are real business benefits.

stead, I've been telling them that the answer doesn't exist, that there are many answers depending on their particular circumstances, that all the pieces don't fit together and that sometimes they need to take a step of faith.

In short, I've been telling them that every client/server project is a trip down a partially completed road, and they may have to go over some shaky terrain before reaching their destination. I'll try my hardest to help keep the car on the road, but I can't guarantee that it will be an easy trip.

What I can guarantee is that I've been on this bridge before (or at least a hundred very similar to it). Somehow or other, I and my passengers have made it across, arriving at our destination on time and within budget.

We got our bruises and had our scrapes. We had to use a handaxe or two, but we made it. And it was worth it because there really is a

better place on the other side of the bridge.

That is, there is a better place if you know what you're looking for. If you're just looking for "new technology," you may find the trip poses too many hazards, and it doesn't always make a big difference whether you make the trip or not. If you're looking for a "less expensive place to live," you will be sorely disappointed. It may even be more expensive.

But if you are looking for "real business benefits from flexibility and improved customer interfaces," then you will quickly realize that you are taking the right route and you'll be glad you made the journey.

If the justification for taking the trip in the first place is clearly spelled out in terms of business needs and benefits, then your journey will be rewarded. The most important factors in client/server system success are often the non-technological ones: Clear objectives aligned with business needs and ongoing user involvement.

As for my recurring dream, I expect to keep repeating it, probably for a long time. Will I wake up frightened? Not as long as I remember what I'm looking for on the other side.

Grochow is chief technology officer at Ameritech Management Systems, Inc., a consulting firm in Fairfax, Va.



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SOFTWARE PIRACY. 41

Desktop Computing

PCs AND SOFTWARE • PORTABLE COMPUTERS

Windows 95 ushers in better, cheaper software for CAD users

By Cheryl Gerber

Users of computer-aided design (CAD) software stepped out of their niche and into the more consumer-friendly PC software mainstream when Autodesk, Inc. and other vendors recently announced Windows 95 versions of their products.

The Windows 95 versions will mean cheaper, more reliable desktop CAD software, analysts said.

Autodesk in San Rafael, Calif., announced it would begin shipping the Windows 95 version of its leading AutoCAD Release 13 software in the next three months.

At the same time, Parametric Technology Corp. in Waltham, Mass., made its entire Pro/Engineer CAD product line available immediately on Windows 95.



Autodesk's Windows 95 version of its AutoCAD software will help propel CAD to the masses, analysts say.

Computer-aided design

Intergraph Corp. in Huntsville, Ala., announced that Windows 95 versions of its architecture engineering and construction (AEC) software began shipping the same day as the operating system.

While Parametric and Intergraph historically have thrived in the high-end, high-priced Unix CAD niche, Autodesk's lower-end, lower-priced CAD line has suffered the limitations of the 16-bit DOS and Windows 3.x environments, noted Kathy Hale, an analyst at Dataquest, Inc. in San Jose, Calif.

The limitations of DOS and Windows 3.x haven't stopped Autodesk from becoming the world's largest supplier of CAD, computer-aided manufacturing and computer-aided engineering software, noted Bruce Jenkins, vice president at Daratech, Inc., a research firm in Cambridge, Mass.

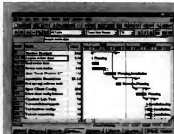
Ready to roll

An AutoCAD Windows 95 beta tester said the 32-bit version fulfills pent-up user demand for AutoCAD to move from a 16-bit to a 32-bit operating environment. "We're gearing up for the upgrade now," said Bud Schroeder, a computer analyst at Northern California Power Agency (NCPA), a utility in Middletown, Calif.

NCPA plans to use a mixed CAD, page 41

Keep it simple!

Users applaud Microsoft Project 95's ease of use



Microsoft hopes to increase overall usage of Project 95 by appealing to users of Office applications.

Project points

Here are some features in Microsoft's Project 95 that include the following:

- **Compatibility with Office 95** - more than 100 common commands and features.
- **Enhanced customizability** - improved Visual Basic and OLE functions.
- **Enhanced database support** - ODBC to high-end databases.
- **Improved integration with Microsoft's Mail and Schedule.**

By Stuart J. Johnston

Microsoft Corp. is making its new Windows 95 version of its project management software easy for first-time users, and at least one beta tester says the company is on target.

"Training new project managers [on Project 95] is a breeze," said John O'Neill, president of Micro-Frame Technologies, Inc., a software development company in Ontario, Calif., with approximately 100 employees.

O'Neill said much tighter integration with Microsoft's Office productivity applications, including a greater consistency with Excel and Word, simplifies the training of users who can already run the other applications. In addition, features

borrowed from Office 95 also ease the task of learning the software.

"The people who are most likely [to use Project 95] are Office users, and if you know Office, you already know over 100 commands" in Project 95, said James Mustan, product manager at the Project business unit.

Left out

One feature of Office 95 not supported by the new version of Project, also known as Project Version 4.1 or Project 95, is Office's Binder. Binder enables users to collect all of the various files into a single file that can be copied to a floppy disk or posted on a network as one file.

Tom Smith, president of The Syllabus Project 95, page 47

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Desktop Computing

Intel rivals run into chip roadblocks

P6 competitors stalled until mid-1996; little impact on pricing expected

By Jalil Kumar Vijayan

Even as Intel Corp. flexes its marketing muscle for the push into the P6 generation, rival clone vendors Advanced Micro Devices, Inc. and Cyrix Corp. are still struggling to get their post-486 products on the floor.

And NexGen, Inc., the Milpitas, Calif.-based chip vendor that announced the first Pentium class chip last fall, has yet to gain any kind of mind or market share in mainstream corporate accounts.

What's a wait

What this means for users is that the plethora of choices these vendors were supposed to bring to the market by year's end has fundamentally fizzled. Mid-1996 is the next likely target for volume shipments of Pentium class products.

Yet this lack of Intel alternatives is unlikely to have any significant impact on system prices.

"To decide, you need to make a comparison: first, and that is not possible today since there are no Pentium clones to begin with," said Peter Pfeilwitz, PC support manager at W. B. Saunders Co. in Philadelphia.

For the moment, Cyrix looks like

How the chips stack up		
Vendor/Chip	Availability	Clock speed
Qyrix/86	Sampling now; shipments begin Q3 1995	100 MHz
AMD/6	Sampling now; volume shipments begin Q3 1995	Matches current Pentium chips
NexGen/Next	Shipping now	Equivalent of 75-, 90- and 100-MHz Pentiums

PC price picks up

1995 could end up being a very strong year for PC sales, according to estimates from market researcher Semia Research. The company projects that an estimated 27 million to 28 million Pentium systems will be sold this year. Estimates for 1996: 57 million PCs, out of which Intel's share is expected to be in excess of 50 million.

It will be ahead of AMD with a Pentium-class clone, analysts said last week. According to a Cyrix spokeswoman, the company is preparing to announce its M1 chip before the end of the month.

The chip, which Cyrix is positioning as a sixth generation-class chip comparable to Intel's P6, is expected to find its way into a limited number of PCs by year's end.

Cyrix had some early problems with a larger than usual die size on the M1 chip, but it recently announced a 100-MHz intermediary chip called the i586. That intermediate chip combines features of both—the standard system interfaces of the 486 with Pentium-class core technology—and is being targeted at low-end corporate Pentium performance.

Cyrix will initially ship a 100-MHz version of the M1, which ana-

lysts expect will be nearly equivalent in performance to Intel's 120- and 133-MHz Pentium chips. Volume ramp up is expected to begin in the fourth quarter, when the company will also announce a 120-MHz

chip that will equal a 150-MHz Pentium chip, according to a company spokeswoman.

In the meantime, AMD, which has put its K5 plans on temporary hold while it continues to map the lucrative 486 market, doesn't expect to have any kind of volume availability on its Pentium clone at least until the first quarter of 1996.

AMD will concentrate on the 486 market for the remainder of the year before turning to the K5 early next year, a company spokesman said. AMD hopes to ship at least 5 million K5 chips next year.

The first is ramping up manufacturing capacity and recently moved into a 0.35 micron process technology, which it is using to create an 100-MHz 486 clones.

NexGen is still struggling to gain

widespread credibility in the market. Despite recently signing up Compaq Computer Corp. as a major customer, NexGen's volumes are still far too small to make it a threat to Intel.

Price-conscious Pentium

Still, the relative lack of any competition isn't stopping Intel from maintaining relentless pricing pressure on its rivals. The desktop giant has continued to drop Pentium prices at a rate guaranteed to make it difficult for rivals to match or compete against, said Tony

Massimini, an analyst at Seizure Research Corp. in Phoenix. In its most recent round of quarterly price cuts, for instance, the company surprised analysts by dropping Pentium prices even more aggressively than market expectations. A 100-MHz Pentium chip that was expected to sell for roughly \$420 in quantities of 1,000, dropped to \$396.

This means users can expect to see fully loaded 100-MHz and possibly even 120-MHz Pentium systems retailing for about \$2,000 by the end of the year, Massimini said.



IBM's Butterfly floats, but pricing stings

Latest ThinkPad packs a punch, but is costly at \$5,350

By Howard Millman

"Seldom would we use the words 'dainty,' 'tender' and 'butterfly' in the same sentence with IBM, but one of IBM's newer portable computers justifies this one-time infraction."

The ThinkPad 701C, nicknamed the Butterfly is filled with innovative features. It deftly combines ease of use and competent performance in a compact 4½-pound package. In fact, everything in this unit is lightweight—except its \$5,350 price.

For the money, however, you receive a wealth of intelligent features. One especially remarkable attribute is the Butterfly's expanding keyboard. As the cover opens, the two-piece keyboard diagonally slides together and interlocks to form a seamless typing surface. Driven by a simple cam in the cover's hinge, the 85-key board expands by nearly two inches in width when open.

Other features include a crisp 10.4-in., 256-color active-matrix screen. The video subsystem is powered by a 32-bit Video Electronics Standards Association local bus with 1M byte of video RAM and provides 640-by-480-pixel resolution. The video subsystem also sports

screen refresh rates fast enough to avoid LCD ghost images even when playing video clips at 15 frames/sec.

The Butterfly's 9.7-by-7.9-by-1.7-in. case holds a 680X2 50-MHz CPU, 8M bytes of RAM, data/fax modem and two Type II or one Type III PCMCIA slots. While our evaluation unit didn't set land speed records, the 50-MHz chip delivered adequate performance on common office tasks. A model featuring a 75-MHz 680X4 CPU and costing \$5,650 is a worthy investment if you plan to use the unit for presentation graphics or multimedia.

The Butterfly's small size and light weight make it easy to carry. That's a good thing, too, because IBM doesn't include a carrying case.

Hard drive options include 300M-, 540M- or 720M-byte models. Owners can quickly remove and replace drives for fast upgrades, unlimited storage and data security. IBM bundles a variety of software, including PC-DOS 6.3 and Windows 3.1. Many of the user applications, however, are demos with limited functionality.

Telephony features are made possible by a SoundBlaster-compatible subsystem that provides speakerphone and answering machine capability.

Of all the Butterfly's many attributes, the keyboard steals the show. It is approximately the size of a desktop keyboard. For beginner typists, full-size keys and standard placement translate into far fewer typing mistakes. IBM places the postnosed mouse control in the bone row with dual-click buttons conveniently centered just below the space bar.

Keyboard issues

The expanded keyboard measures 11½ by 5½ inches overall. When the keyboard expands, it covers the on/off switch. But we think this a minor issue because we rarely shut the machine off. We merely closed the cover, and it hibernated.

Battery life during our tests ranged from two to four hours, depending on the amount of disk access and the aggressiveness of the power saving settings we selected. The device uses a lightweight nickel cadmium battery pack that recharged in about an hour; the thin recharger plugs into a wall outlet.

Exchanging data between computers is a breeze without a floppy disk drive. Someday infrared ports and null modem cables will increase in popularity—but for now, a disk drive is a practical necessity.

Millman operates the Data Systems Services Group, a networking advisory and installation service in Croton, N.Y. He can be reached at hmillman@netmail.com.



Product highlights

- IBM's Butterfly portable has the following features:
- Weight: 4½ pounds.
- Price: \$5,350.
- Advantages: Expanding keyboard, memory video.
- Disadvantages: Need an external floppy drive to exchange data between Butterfly and another computer.



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Introduction



Better Decisions Mean A Better Bottom Line

1995 could be dubbed the year of the data warehouse. In the past eight months, most vendors of large systems and databases have announced data warehousing programs and strategies, and most large corporations have initiated projects to build data warehouses. Meanwhile, there is a data warehouse conference somewhere in the world every month.

With all the hype and hoopla, you might think there is something radically new about the concept of data warehousing. In reality, data warehousing is simply a new approach to gathering data and generating reports from corporate information systems.

Data warehousing differs from traditional reporting systems in two ways. It gives end-users direct access to corporate data with powerful graphical query and reporting tools. And it calls for the creation of a separate decision support database extracted from one or more operational systems.

These two principles fundamentally alter the way business users interact with corporate data and how companies leverage that data. With data warehousing, the IS shop is no longer a broker between business users and corporate data. Users access the data directly, when and how they want. Instead of submitting requests to IS that might take weeks to fulfill, they can execute queries and build reports on their workstations... freeing the IS department to focus on tasks such as building applications.

Data warehousing also lets users navigate large corporate data stores in an ad hoc, interactive fashion without impacting mission-critical operational systems. Users can issue one query after another in an iterative manner to explore trends, pinpoint problems and evaluate market opportunities. The result is that business users can make better decisions more quickly, and, in so doing, add to a company's bottom line.

Wayne Eckerson is a consultant for The Patricia Seybold Group, and editor-in-chief of its monthly report, *Open Information Systems*. Eckerson specializes in the areas of mainframe migration, data warehousing, decision support tools and distributed computing middleware. He also has editorial responsibility for covering client/server and open systems trends and products. The Patricia Seybold Group is a Boston-based consulting, research, and information services firm that specializes in client/server and distributed computing. It is recognized as a leading consulting and research firm in the fields of distributed object computing, groupware, end-user computing and DBMSs.

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Most companies now realize that the only way to sustain an advantage in today's economic climate is



to leverage information better than the competition. But in most companies, information is locked up in large, operational systems as well as desktop databases, personal rolodexes, trip reports and meeting notes. And external data, such as newspaper articles, point-of-sale data and market feeds, is something that few companies effectively leverage. Data warehousing promises to unlock the breadth and depth of corporate data and make it available to end users. Companies that can best tap into this information will enjoy a competitive advantage.

Data warehousing has been made possible by several client/server technologies. Personal computers with snazzy GUIs have made it easy for end users to manipulate and analyze data. Powerful Unix servers and relational databases have made it possible to bring data closer to end users. The sharp decline in disk drive prices makes it cost-effective to store vast amounts of data on low-cost open systems platforms.

Separate data stores

Data warehouses are separate data stores designed to support decision support applications. A company populates a warehouse with data from operational databases as well as whatever unstructured and external data is appropriate. There are good reasons to create a separate decision support database or data warehouse. A separate warehouse minimizes the impact that queries have on operational systems and safeguards operational data from being changed or lost. It also allows administrators to create new data by merging fields from more than one operational system. A warehouse can also be modeled to conform to the way in which users view data.

Building a data warehouse requires many components (Figure 1). Most data warehouse vendors have formed alliances with providers of niche technology to round out their offerings.

Extract/transformation tools provide administrators with a GUI for mapping operational data into a data warehouse. They allow administrators to con-

vert and integrate operational data, resolving inconsistencies in syntax, data formats and definitions. These tools can also aggregate data by adding all rows for a particular field or applying other mathematical computations to derive new values.

These tools generate an extract program, usually in Cobol or C, that runs against the legacy system and spits out a flat file. They also generate detailed meta data that describes source and target databases, types of transformation applied, date of last refresh, etc. Vendors that offer such tools include

Prism Solutions, Carleton, Evolutionary Technologies (ETI) and Apertus.

Most data transfer tools take a flat file generated by an extract program and move it to the target data warehouse, where it is loaded. The most common way to move extract files is by "sneakernet" via tape.

After that, companies use either bulk file transfer tools, such as Trinzic's InfoPump or Legent's Legacy Data Mover, or database gateway tools, such as Oracle Gateways or Information Builders' EDAS/SQL.

More sophisticated methods of transferring data include database replication services and message-oriented middleware. These tools are useful when companies just want to propagate delta changes from operational to data warehouses. Delta change replication is critical when there is not enough time in an overnight batch window to reload an entire database.

The data warehouse is a database that must have a logical and physical model before it can be populated. Such a model can be created with pencil and paper, or with advanced modeling tools that automate the process and capture relevant meta data, such as CASE tools.

Most data warehouses are built on RDBMSs, usually running on Unix, although there are many MVS/DB2 warehouses. Three criteria for RDBMSs are whether they can scale to support huge volumes of data and complex queries; which client-side tools they support; and how fast their loading mechanisms are, to minimize downtime for users.

RDBMSs can be distinguished by how much they



separate warehouse minimizes the impact that queries have on operational systems and also safeguards operational data against being changed or lost.

support parallel database operations, data partitioning, indexing schemes and table join methods. Traditional criteria such as performance, portability and manageability are also valid for warehouses.

The hundreds of query tools available all give users a GUI for selecting a data set, defining a query and creating a report to output the results. More advanced tools map tables and columns in a back-end database to business subjects, such as customer, product and region; this shields users from having to learn SQL or the internal structure of a database. Sophisticated tools also offer server-based processing to offload complex or long-running queries from the client as well as to provide centralized control of security and resource management.

No one tool meets the needs of all business users. To serve their different constituencies, most companies buy many tools. One tool may meet the needs of 80% of all users, but there are always specialists or generalists who require something different.

Four types of users

The Patricia Seybold Group defines four types of business intelligence users: Clerk, Knowledge Worker, Analyst and Executive. Each has different information requirements (Figure 2). Many companies purchase different tools for each type. For example, Chase Manhattan uses a custom-built PowerBuilder application for routine data access and executive drill down, Business Objects for ad hoc query and reporting and SAS for statistical analysis.

In decision support environments, multidimensional analysis is critical; it allows users to view and analyze data along dimensions such as product, geography and time. Users can then drill down to find exceptions and trends. A product manager might need to view sales of canned goods this year versus last year, but may want to drill down to find out soup sales in the Southeast during May.

Multidimensional analysis has been the province of specialized databases that precompute values at the intersection of all dimensions prior to loading data. Special tools, such as Pilot LightShip, Cognos PowerPlay and GQL Pablo, are required to access these databases. However, the newest ad hoc query tools, such as MicroStrategy's DSS Agent and Prodea Software's ProdeaBeacon, can perform multidimen-

sional analysis against relational databases.

Multidimensionality has quickly become an earmark signalling the robustness of a vendor's decision support or data warehouse offering. Oracle's recent acquisition of IRI Software, a company that provides a specialized multidimensional database as well as accompanying tools and applications, is the most aggressive move to date by a data warehouse vendor to offer multidimensional capability.

The above mentioned components and requirements offer a framework for evaluating Oracle's data warehouse initiative, which was launched in June.

Customers drive solutions

Oracle's data warehousing initiative has been driven by its customers. Rather than Oracle foisting new technology upon its installed base, customers have asked Oracle for direction to advance planned or existing data warehouse projects. Customer interest in data warehousing caught Oracle unprepared, but it is now racing to catch up with demand.

Oracle has shaped its data warehouse program accordingly. Instead of pitching products and technologies, Oracle has recognized that customers want integrated solutions. Selling solutions, rather than technology, is a new approach for Oracle. But it is taking steps to ensure the success of the program.

For instance, Oracle has established new communications channels among its previously independent product groups, and it has created a partners program to foster ties with vendors of data warehouse components. Without integrated components and strong partnerships, Oracle realizes it cannot deliver the data warehouse solutions users want.

It is safe to say that more customers of Oracle are building data warehouses than any other vendor. That so many companies are using Oracle7 as a foundation for their data warehouses, as well as other Oracle products, testifies to the suitability of Oracle technology for decision support solutions.

But Oracle is not sitting still. The company provides a full set of data warehouse components, offering query tools, development tools, CASE tools, SQL gateways and data warehouse consulting. Oracle may not offer best-of-breed tools in each category, but the breadth of its offering provides a haven for users who want one-stop shopping. In areas where

Oracle does not provide tools or services, it has allied with key players (Figure 3).

The foundation of Oracle Warehouse is the Oracle7 RDBMS, which runs on dozens of platforms, including Unix, MVS and Windows NT. It scales from the desktop to symmetric multiprocessing clusters and massively parallel processing machines. Oracle7 also supports all types of data that data warehouse users may want to access: structured data, text, image, audio and video. Oracle SQL*Net is middleware that provides connectivity to Oracle7 from desktop applications and legacy systems.

If Oracle7 is the foundation, Oracle Services is the glue that helps users meld Oracle Warehouse components into a working application. Oracle is training a high percentage of its 4,000+ worldwide consulting force to provide the project planning and expertise to manage data warehouse accounts.

Today, there are more than 100 Oracle consultants piecing together their experiences to build and refine a data warehousing consulting framework or methodology. During the next 18 months, Oracle plans on training all its consultants in this methodology via a series of six-week "boot camps."

To jumpstart data warehousing projects, Oracle is crafting data model templates for vertical industries. It already has a marketing management model for telecommunications, a template that it plans to replicate in other industries. Oracle consultants will

play a big role in building very large data warehouses. It is unclear at this time whether Oracle will also provide a quickstart program to help companies build small warehouses or whether it will outsource this to systems integration partners.

To fill in the gaps of its data warehouse solution, Oracle has established an alliance program, the Warehouse Technology Initiative (WTI), in which a host of partners provide tools for scrubbing and extract/transformation, modeling and query/reporting. Many of these tools compete with existing Oracle products. For example, a dozen WTI partners offer query and reporting tools that compete with Oracle's Discoverer/2000 series. Oracle opted to provide an open solution rather than force users to deploy tools that they may not like or swap out tools that they have already deployed.

The idea behind WTI is to create a dialog between partners and Oracle developers to forge stronger integration between WTI tools and Oracle products, as well as resolve customer problems more quickly. WTI partners get advance information about Oracle products and strategy, pre-release software and documentation, and early training on new Oracle data warehouse technologies. Oracle gets to promote Oracle/WTI solutions at seminars and trade shows and with its consultants and salesforce.

The following is a review of Oracle's data warehouse offerings:

Decision Support Tools

Types of Users	Information Requirement	Type of Tool	Available Products
Clerks	Basic data retrieval	Custom applications	• Developer/2000 • Express Objects • PowerBuilder • Visual Basic
Knowledge Workers	Ad hoc database navigation, and point-and-click reporting	Ad hoc query and reporting	• Discoverer/2000 • Business Objects • Antares SQL Bro • DataPost
Analyst	Complex analysis	Multidimensional and statistical analysis	• Express Analyzer • SAS • MicroStrategy • Prodec Software
Executives	Graphical Drill Down	Executive Information System	• Pilot Lightship • Forest and Trees • Express Analyzer

Source: Patrick Sweeney

DATA WAREHOUSING

White
Paper

Oracle's Larry Ellison on A&T WorldMark Servers.

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Scrubbing, extraction and transformation. Oracle relies primarily on WTI partners to clean up and transform legacy data prior to loading it into a data warehouse. Oracle partners with Innovative Systems and Vality for scrubbing products. It works with Prism Solutions, Carleton and ETL, three companies that provide extraction and transformation products that work with most legacy systems.

Besides transforming legacy data, extraction/transformation tools also generate warehouse meta data as a byproduct of their mapping data between source and target databases. This makes these tools critical for maintaining and updating data warehouses. Oracle will work with Prism, Carleton and ETL to create bidirectional bridges between these transformation products and Oracle tools such as Discoverer/2000 and Designer/2000.

Transfer and load. Oracle has many tools to move data from legacy systems to data warehouses. Oracle Transparent Gateways provide connectivity to Oracle7 from mainframe data sources, such as IMS, DB2/MVS, VSAM and IDMS, as well as Unix-based RDBMSs from Informix, Sybase and Computer Associates (CA Ingres). Oracle also has a DRDA Gateway for accessing IBM DB2 and other DRDA-compliant databases.

The gateways enable administrators to use SQL to populate Oracle7 with legacy or non-Oracle data. The gateways also can perform data transformations of SQL data, such as combining, separating, renaming and computing table fields. Users can also employ the gateway to transfer data into a staging area where more sophisticated transformations can be applied, perhaps with Oracle's PL/SQL.

An unforeseen bottleneck in data warehousing is the process of loading data into the warehouse once a gateway or file transfer mechanism gets it there. Often companies have a small window at night when they

can run a batch program to load the warehouse. This can be a big problem when data warehouse volumes exceed hundreds of gigabytes and must be refreshed on a nightly or weekly basis.

Oracle offers several mechanisms for loading warehouses. For high-speed loads, a parallel direct-path loading utility pages data directly to disk in parallel. This utility can load in excess of 100GB of data per hour, depending on the number of disks, processors and instances of the loading utility applied. Companies that want to ensure the integrity of data being loaded can use SQL inserts to load an Oracle7 database.

Companies can ease loading volumes by propagating only the operational data that has changed rather than refreshing the entire warehouse. Replication is a natural fit to propagate delta changes. Oracle plans to expand its symmetric replication facility in Oracle7 to work with non-Oracle databases.

Data Warehouse Functions

- Extraction, transformation and transportation
- Large volume data loading
- Indexing large tables
- Backup/recovery of large data sets
- System fault-resilience
- Data warehouse security
- Fast query performance on large data sets
- User-defined server-based business functions
- Text/document storage and retrieval
- Multi-media/video storage and retrieval
- OLAP storage and retrieval
- Spatial data storage and retrieval
- Internet and World Wide Web interfaces
- Warehouse design & meta data management
- Ad hoc query and reporting — relational
- Custom application development — OLAP
- Data warehouse pre-built applications

Oracle Products/Features

- Oracle Transparent Gateways
- Oracle Symmetric Replication
- Oracle SQL*Net
- Oracle Parallel Direct Path Loader
- Oracle Parallel Index Builder
- Oracle Parallel Backup & Recovery
- Oracle Parallel Server
- Oracle Secure Network Services
- Oracle Parallel Query Option
- Oracle Cost-Based Optimizer
- Oracle User-defined SQL functions
- Oracle PL/SQL
- Oracle TextServer with Context
- Oracle Media Server
- Oracle Express Server
- Oracle Spatial Data Option
- Oracle World Wide Web Interface II
- Oracle Designer 2000
- Oracle Discoverer/2000
- Oracle Express Analyzer
- Oracle Developer/2000
- Oracle Express Developer
- Oracle Applications Data Warehouse
- Oracle Sales Analyzer
- Oracle Financial Planner

Source: Oracle Corp.

DATA WAREHOUSING

White
Paper

including legacy systems. This will facilitate the growth and maintenance of large-scale data warehouses on Oracle7.

Modeling. Before you can load a data warehouse, you need to create a logical and physical data model for it. Oracle Designer/2000 is an upper- and lower-CASE tool that can be used to create these models as well as the meta data for maintaining the data warehouse. Earlier this year Oracle added process modeling and systems design modules to the product.

One challenge in modeling a data warehouse is knowing in advance what kinds of information users need. The process modeler enables database administrators to capture user requirements by charting business processes. The tool can be used to identify the sources of data users need, how often it needs to be refreshed, the depth and breadth of information required and user expectations about accessing it. This forms the basis of warehouse meta data.

The systems designer — Oracle's lower-CASE tool — maps the entity-relationship diagram (logical model) to a physical model. It can generate star schema models which offer fast-performance query-intensive environments. The module also defines tables, indexes and views to optimize data access.

Required element

The only required element in Oracle Warehouse is Oracle7. Oracle laid the groundwork for its data warehouse initiative in June 1994 when it added the Parallel Query Option (PQO) to Oracle 7 Release 7.1. With PQO, Oracle 7 Release 7.1 can execute queries in parallel that include at least one table scan. PQO parallelizes all query operations, including scans, sorts, joins and aggregations. Parallel queries can reduce the time required to process a request as well as scale up the request to run against more data without suffering a drop in performance. PQO also parallelizes index builds, data loads and user-defined functions. Oracle7 already provides support for parallel backup, restore and recovery.

Oracle recently released Oracle7 Release 7.2 and will ship Oracle7 Release 7.3 by year-end. To improve query performance, both releases contain the enhancements listed below:

Direct Database Reads and Writes. Parallel query

processes must often scan very large tables or write results back to disk. Direct Database Reads provide direct contiguous disk to contiguous memory reads, and Direct Database Writes provide direct contiguous



One challenge in modeling a data warehouse is knowing in advance what kinds of information users need.

ous memory to contiguous disk writes. This also minimizes contention with OLTP activities.

Asynchronous I/O provides async read-ahead capabilities to maximize processing and I/O resources. This complements Oracle's async write facilities for sorts, summarizations, index building and loading.

Parallel Table Creation. Databases often create temporary tables to hold interim or summarized results of queries, particularly during drill-down analysis to hold the results of intermediate operations. An option in Oracle7 turns off logging functions to improve the performance of table creation. This option also applies to loading and index creation.

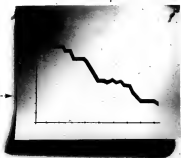
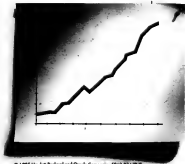
Support for Star Query. Optimization, Oracle's optimizer, recognizes star schema databases and can issue optimized star queries. Star queries improve performance against databases using star schema models. A star query first joins multiple small tables, then joins the results to a single large table.

Disk Affinity adds intelligence to PQO's query coordinator, mimicking intelligent partitioning capabilities supported by other databases. Disk affinity means the query coordinator knows which disks (hence data) are associated with which nodes (CPU's) and can ship functions or query operations to those nodes directly for processing, bypassing a shared interconnect. Disk affinity and function shipping can yield all the benefits of a "shared nothing" architecture without associated overhead and costs.

Histograms provide the optimizer with a picture of the distribution of values in a table column, enabling it to select the most appropriate index.

Parallel Hash Joins speed small-to-large table joins which are typical with star schema databases. Parallel hash joins eliminate the need to sort data to per-

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form joins. Oracle already supports parallel sort-merge and nested-loop joins.

Parallel UNION and UNION ALL. In Release 7.3, Oracle7 will be able to execute queries in parallel that use the set operators UNION or UNION ALL. This will make it easier to manage large tables as a manually partitioned set of smaller tables.

Performance. Oracle recently performed internal tests on Oracle7 Releases 7.1, 7.2 and 7.3. The tests were conducted on a 16-processor Sequent SMP machine running a 100GB database. Oracle claims the tests showed significant performance increase between the releases. Performance for executing complex queries doubled between Releases 7.1 and 7.2, and quintupled from Release 7.2 to 7.3. Performance for drill-down actions increased by 10 times and 20 times from Release 7.1 to 7.3.

Oracle7 Release 7.1 supports dynamic partitioning of data. This means two different processes can run against the same disk simultaneously, improving throughput. It also allows Oracle7 to repartition data dynamically in memory to facilitate a join when data spans nodes. In contrast, most other databases



disk affinity and function shipping can yield all the benefits of a "shared nothing" architecture without associated overhead and costs.

support static partitioning, where an administrator must manually repartition the data.

Oracle7 supports multiple data types through add-on modules or gateways. These are:

Oracle TextServer with ConText. This Oracle7 add-on enables users to store and retrieve text and documents through applications using SQL.

Oracle Spatial Data Option. Lets users store spatial data, such as maps, charts and digitized images, in Oracle7 rather than specialized geographic information systems. Data can then be accessed via SQL by visualization and analysis tools such as MapInfo.

Oracle Media Server. Lets Oracle7 store or retrieve multimedia data (audio, video, text and images).

World Wide Web Interface Kit. This gateway enables companies to capture and insert World Wide Web data into Oracle7 on the fly, and vice versa. This is available for free on the Internet.

Query Tools: Discoverer/2000 combines new releases of two query products, Oracle Query and Oracle Browser. Oracle Query presents business users with pivot tables to drill down on multidimensional hierarchies. Oracle Browser gives developers the option to work directly against relational tables. Both are two-tier, client/server applications. The two products are packaged together and sold for \$395.

In Discoverer/2000, both tools can work off the same meta data or semantic mapping layer. This layer insulates users from SQL and database structures. It presents a business-oriented view of data in Oracle7 databases. In addition, both tools leverage an Oracle7 API call that allows users to submit long-running queries without tying up their client machines. The tools also are available on Windows, Macintosh and Motif, and provide integrated reporting and charting. They also integrate with other desktop productivity tools via OLE.

Oracle has established partnerships with more than a dozen providers of query tools. Most of these tools, like Discoverer/2000, provide limited forms of analysis. For example, multidimensional views of data must be hard-wired with SQL, making the tools difficult to administer. Tools in this category include Business Objects, Cognos Impromptu, Audyne GQL and Brio DataPivot.

Tools from several WTI partners generate multidimensional analyses on-the-fly as well as other calculations, such as rankings, sorts, averages, aggregations and variances. Moreover, these tools perform such analyses against relational data without sacrificing performance. Typically, such analyses require specialized multidimensional databases to ensure adequate performance. WTI partners that provide "multi-relational" tools are MicroStrategy (DSS Agent), Information Advantage (Axsys) and Stanford Technology Group (MetaCube.)

Oracle acquired IRI Software to offer sophisticated analytical tools for business analysis and managers. IRI provides a proprietary multidimensional database, now called Oracle Express Server, as well as tools for leveraging multidimensional data, includ-

Oracle Warehouse Technology Initiative Partners

• Andlyne Computing Ltd.	• Logic Works
• BancWare	• MapInfo Corp.
• Brite Technology	• MicroStrategy
• Business Objects	• NextTek Software Inc.
• Carleton Corp.	• Open Gate Corp.
• Cognice Corp.	• Pilot Software
• DB Star	• Platinum Technologies
• Dynamic Information Systems	• Portalsoft
• Exploratory Technologies	• Praxis International
• Holistic Systems	• Prime Solutions
• Information Corp.	• Prodis Software
• Information Advantage	• QOI Software Inc.
• Information Builders	• Sequent Computer Systems
• Information Harvesting Inc.	• Smart Corp.
• Innovative Systems	• Software AG
• IQ Software Corp.	• Stanford Technology Group
• IRI Software	• Vality Technology
• Kanan Systems	

Source: Oracle Corp.

applications include the Oracle Financial Planner, a client/server decision support application; and Excel Add-In, a spreadsheet interface to Express. Technology applications include Oracle Express Analyzer, a reporting and analysis tool; and Oracle Express Object, an object-oriented environment for creating multidimensional applications.

These applications and tools round out Oracle Warehouse. IRI's tools provide analysis capabilities that complement Oracle's and its partners' ad hoc query and reporting tools.

For customers who want to build their own query and reporting applications, Oracle offers Developer2000 (formerly called Cooperative Development Environment). It consists of three tools — Oracle Forms, Oracle Reports and Oracle Graphics — that generate applications for Windows, Macintosh, Motif and character platforms.

Conclusion

Oracle is in a prime position to succeed in data warehousing. It has one of the most robust database servers, the largest installed base of warehouse users, the biggest consulting practice and a broad line of data warehouse components.

Oracle must remain focused and committed. If it falls back into old habits of pushing products instead of solutions, it may disappoint its customers — or worse, cede the market to others. Oracle needs to continue to pry open channels within the company to ensure cooperation among product groups.

It is important that Oracle integrate appropriate products to make implementing an Oracle Warehouse relatively painless. Data warehousing by nature is a systems integration exercise, and the most value Oracle can provide is to create a unified environment that gets people 80% of the way to their destination.

Consequently, Oracle needs to lead with its consulting group, to let its consultants and salespeople on the front lines drive its data warehouse program and identify areas for new services and products and opportunities for integration.

Data warehousing is one of the first manifestations of a kinder, gentler Oracle that knows how to partner with third parties and also knows how to cooperate internally to provide customer-focused solutions. Let's hope it continues. ■

ing Oracle Express Objects and Oracle Express Analyzer. On the server side, Oracle will initially offer Express as a front-end to Oracle7. Users can work directly against Express or they can pass through SQL requests in the form of stored procedures to Oracle7.

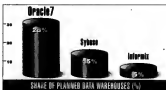
Oracle plans to tighten integration between the two products to improve the performance of the pass-through capability. Oracle also wants to create a bidirectional interface in which Oracle data is pushed into Express in a synchronized, manageable fashion. Long-term, Oracle is considering incorporating Express into the Oracle7 engine.

On the client side, Oracle picks up various analytical applications and tools that run against IRI Express. These include sales and marketing, financial and technology applications.

The sales and marketing application named Oracle Sales Analyzer includes an ad hoc query tool, and a library of predefined reports and graphs for analyzing sales performance and trends. Financial

Data warehouses are central information repositories for storing and analyzing vast amounts of historical and reference data from a number of different sources, enabling users to gain insights into corporate performance and customer behavior that cannot be gained using disconnected operational systems. Oracle7 has more production features for data warehousing than any other DBMS available, bringing very large databases capacity, fast query execution and the management of any data type to the open systems data warehouse.

	ORACLE7	Sybase System 10	Informix 7.1
1. Single User Access	Lots	Never	None
2. Concurrent Access	Hundreds	Never	None
3. Shared Access	Yes	Never	Yes
4. Shared Access	Yes	Never	No
5. Shared Access	Yes	Never	Yes
6. Shared Access	Yes	Never	No
7. Shared Access	Yes	Never	Yes
8. Shared Access	Yes	Never	Yes
9. Shared Access	Yes	Never	No
10. Shared Access	Yes	Never	No
11. Shared Access	Yes	Yes	No
12. Shared Access	Yes	Never	No
13. Shared Access	Yes	Never	No
14. Shared Access	Yes	Never	No
15. Shared Access	Yes	Never	No



According to Meta Group, Oracle7 is chosen by users nearly twice as often as Sybase and five times as often as Informix for data warehousing applications. If enabling employees to make fast, accurate decisions is important to your company's performance, call Oracle at 1-800-633-3071, Ext. #197. Or download videos of our customers explaining the competitive advantages they get from the Oracle Warehouse solution at <http://www.oracle.com/info/dw/video.html>

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Burned IS staffers drop a dime on software piracy

By Philip Sim
STOAST

More than half of the software piracy lawsuits filed against corporations in Australia and New Zealand arise because of tip-offs from information systems managers and staffers.



said Ron Eckstrom, vice president of the Business Software Association (BSA) in Asia. IS staffers who have been retrenched or leave under unpleasant circumstances are most likely to turn in their former employers, Eckstrom said. But he and Robert Holleyman, U.S. chairman of the BSA, claim that IS managers are also exposing their current employers.

"IS managers are one of our best sources," said Holleyman. "They know the laws and have spoken to senior management who have just responded by saying, 'We don't care. Go and copy software.'"

He said many IS managers aren't prepared to be responsible in this situation, so they anonymously tip off the BSA.

According to BSA figures, software piracy has decreased sharply in Australia. In 1993, the BSA estimated that 45% of applications used in Australia were pirated. In 1994, that figure dropped to 37%, the third-best result in the world behind the U.S. and Switzerland. In the U.S., 35% of PC applications are pirated; in the UK, that figure is 43%.

Sim is a writer at *Computerworld* Australia.

Project 95

CONTINUED FROM PAGE 29

Telco Co., a technical services consulting company in St. Louis, praised the enhanced customization capabilities in Project 95.

For instance, Project 95 provides enhanced support for Microsoft's OLE 2.0, including the ability to let other applications access information within the application, Mastan said.

O'Neill said he particularly likes the ability to store and retrieve data from server databases besides Microsoft's SQL Server, such as Oracle Corp.'s Oracle database, using Open Database Connectivity. The previous version supported only SQL Server.

Smith said he is also pleased with increased integration between Project and Microsoft Mail and the addition of support for Microsoft's upcoming Exchange Server.

For example, project managers can quickly pick the data to include in an electronic mail message when assigning portions of a project to team members. The team members are then automatically included in the message. When the team member receives the message, the items can be automatically pulled into that team member's to-do list in Schedule+, a group scheduling application in Office 95.

Likewise, when team members send E-mail on their progress, that status information is automatically pulled out of the message and used in the appropriate Project chart, Mastan said.

But most of all, Smith said he is pleased that all the investments his company made in custom Visual Basic code for the last release of Project—Version 4.0—is completely compatible with the new version.

Microsoft Project for Windows 95 will be available by the end of September and will cost \$409 for the full package product or \$149 for upgrades from the previous version.

Desktop Computing

Sales force automation market inches along slowly but surely

By Mindy Hlodgett

The sales force automation software market continues to grow, however slowly, industry observers say.

According to a report by International Data Corp. (IDC) in Framingham, Mass., the sales force automation market grew to \$165.2 million in worldwide revenue in 1994, up 30.9% over 1993.

But many users are still resisting sales force automation, according to analysts. And a glut of companies jumping into the emerging market in the past year or so caused many to founder, according to the IDC report.

Sales force automation

Sales force automation "continues to be a pretty sick industry," says Kenneth Dulaney, an analyst at Gartner Group, Inc. in Stamford, Conn. "Essentially, there are still a lot of companies who don't think they need it. They think, 'I need a good salesman, not a word processor, not a good typist.'"

Sales force automation software is aimed at converting the sales representative to the enterprise by giving the user quick access to key information and databases.

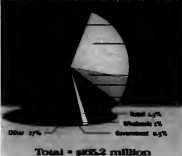
Way to go

Despite the uncertainty of the market, a growing number of companies see implementing sales force automation applications as a surefire way to hold a competitive edge. According to the IDC report, these companies are predominantly in vertical industries, including manufacturing, health care, banking and insurance.

According to Ernest Davis, systems manager at JBL Professional in Northridge, Calif., a distributor of sound systems for movie theaters and musical venues, his company is investigating sales force automation programs "to give us a leg up."

"Right now we have about

Percentage of 1994 worldwide sales force automation software revenue by vertical industry



Source: International Data Corp., Framingham, Mass.

40 people with notebooks out doing sales," Davis said. "But we believe we need more of an automated sales system as a tool to boost sales. I think we need a more organized way to link people up to the enterprise, and sales automation could do it."

As for the sales force automation market, Judith Hodge, an analyst at IDC, said no sales force automation vendor dominates the industry.

Driving forces

"Some of the factors driving the market include such developments as better notebooks, wireless personal communications services networks and use of applications like Lotus' Notes," Hodge said.

According to the IDC report, sales force automation software products in demand include those that are easy to use with graphical user interface features; those that enable users to access a wide variety of enterprise data; and those that are easily customized to satisfy the diverse needs of the marketplace.



CAD users find better software

CONTINUED FROM PAGE 39

Windows 95 and Windows NT environment to track large and small drawings of micro-earthquakes in its water injection wells in Northern California.

Schroeder said the OLE 2.0 support in the Windows 95 version makes linking drawings and text considerably easier. CAD users can simply drag and drop drawings of geothermal drill wells and

steam piping to spreadsheets and other drawings that track which valves need servicing.

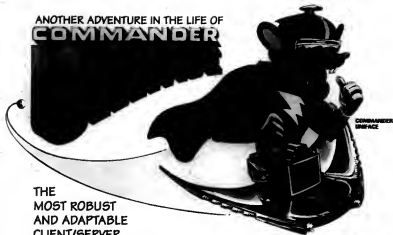
That ability, coupled with the Open Database Connectivity links, will help merge CAD engineering with the corporate side of the utility business, Schroeder said.

One AutoCAD user said it is unlikely that he will want to move to the Windows 95 version now that

he has used the software on NT. "If I had to choose between Windows 3.1 and Windows 95, then I would choose Windows 95. But if I had to choose between NT and Windows 95, then I choose NT," said John McKinley, mechanical design engineer at Texas Instruments, Inc.

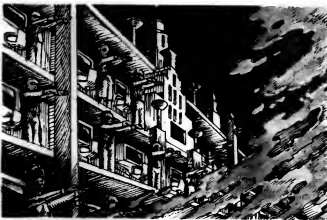
Nevertheless, it is the Windows 95 version that will likely become more popular. "Once Intel PCs with sufficient memory to run Windows 95 become more widely proliferated, then AutoCAD for Windows 95 is bound to be widespread," Jenkins said.

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hurries toward his
destination at Mach
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In a
wondrous display of
wholesome
strength,
Commander
Uniface
banishes the
slow and
rigid software
to the giga-
wormhole of
Baldaran and
forges the
system into
a workstar
of incredible
power!



Later, 3,000 parsecs
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quasi-planar suffer
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Workgroup Computing

LANs • SERVERS • SOFTWARE FOR GROUPS

Suites on the move

Systems management suites outsell stand-alone apps; users face tough decisions

By Steve Moore

No restaurant has a best-of-breed brand of chili that suits all tastes, from tender Yankee palates to fireproof Southwestern gullets. Likewise, vendors of network and systems management software cannot seem to come up with an applications suite recipe guaranteed to make every user's mouth water.

Yet in the burgeoning PC LAN administration software market, suites are already outselling stand-alone applications and are expected to dwarf them within the next few years (see chart). This leaves users with the awkward task of evaluating many complex conglomerations of software.

All shapes and sizes
Software suites are available today to address nearly every

technology administration need, from network and systems management to storage management.

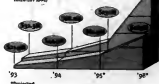
"My preference is to use a single vendor for storage management," said Larry Lemay, a network engineer at Computer Language Research, a tax processing firm in Dallas.

But using one vendor's storage management suite did not do the whole trick because it was used in conjunction with another vendor's LAN management software, he said. "When there are problems, Palindrome points at Novell, and they point their finger back at Palindrome."

Tout de suite

Worldwide sales of PC administration software (integrated suites and stand-alone applications)

- INTEGRATED SUITES
- STAND-ALONE APPLICATIONS (includes network administration and PC management/monitoring)



Source: International Data Corp., Framingham, Mass.

It just muddies the water," Lemay said.

Also, bundled applications aren't always best-of-breed. Lemay added, "Novell's Stackpack is built right into their products, and you don't pay anything for it," he explained. "But it is rudimentary at best and doesn't

meet my needs." However, Novell, Inc.'s standard security software is "pretty good, so you keep the good parts," he conceded.

Because there are plenty of pros and cons to both suites and stand-alone applications, it is up to users to sort them out. Ed Goepfert, a senior information systems analyst at Carolina Power & Light Co.

in Raleigh, N.C., said his policy is to "get everything we can from one source. But if we can't, which is usually the case, we end up having to piece things together."

That is just as well, he added, because "we don't want to be bound into a straightjacket relationship with one vendor."

For its network management platform, the utility uses Hewlett-Packard Co.'s OpenView Network Node Manager as well as network management software from Bay Networks, Inc., 3Com Corp. and others vendors.

Analysts said vendors — sig-

gly or with partners — are slowly getting tighter integration between the components of their integrated software suites, while users are more willing to consider such products.

"The leading-edge users who are willing to do a lot of integration themselves are a rare breed," said Rick Villars, director of network management research at International Data Corp. in Framingham, Mass.

Different views

Most users are unwilling to invest in integrating products themselves and resist hiring systems integrators to do it because what they want is "integration in a box," he added, referring to already integrated suites.

But other analysts disagreed about whether users should opt for suites or make their own best-of-breed selections. From different classes of stand-alone applications.

Users are "better off getting best-of-breed components and using the ones they need" instead of "purchasing a bloated suite that has a two-page feature list when they only need 15 features," said Kristin Marks, managing director at Networks Are Our Lives, a Red Hook, N.Y., consultancy.

While vendors use best-of-breed as a generic marketing term, "the important question for users is, 'Is it best-of-breed for your environment?'" Marks said.

Encryption device ensures end-to-end confidentiality

By Gary H. Anthes

TimeStep Corp. in Kanata, Ontario, has introduced a device intended to secure communication between remote users and local applications.

The device protects individual host computers, which means that corporate information systems staffs no longer need to program security into each application.

TimeStep's Permit 1000 Security Gateway uses encryption to authenticate users and ensure end-to-end confidentiality. Unlike Internet firewalls, which are intended to keep intruders out of corporate networks, Permit 1000 can protect individual hosts behind a firewall against unauthorized internal and external users.

The hardware and software

product is priced at \$4,500.

Chrysler Corp. in Detroit is about to embark on a pilot project in which Permit 1000 will be used to safeguard an executive payroll system that runs in a central data center and is accessed by remote users.

"Our auditors told us we have to secure the server, and we also have to make it so that data and passwords going over the network are not visible," said Robert Moskowitz, a technical support specialist at Chrysler.

By allowing only "trusted partners" — PCs, workstations or notebooks running the Permit software — to talk to the payroll server, Permit 1000 eliminates the need to build encryption or other security measures directly into the payroll application. That is a big help to the de-

velopers, who have their hands full with new object-oriented technology, Moskowitz said.

The Permit software includes two kinds of encryption. It uses public key cryptography from RSA Data Security, Inc. in Redwood City, Calif., to authenticate

users. However, for bulk, fast-speed encryption of file and message contents, it uses the faster Data Encryption Standard algorithm.

The encryption schemes are based on IP source and destination addresses, so system administrators can specify who may communicate with whom.

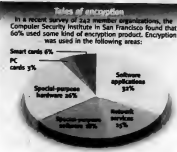
Stephen Franco, a data communications analyst at The Yankee Group in Boston, said the product's ability to protect against internal mischief is noteworthy.

"Most of the attention has

been focused on external security threats, but internal threats are going to prove just as critical," he said. "Security is the No. 1 issue on network managers' minds as they start to implement remote access or electronic commerce applications."

Moskowitz, one of 12 members of the Internet Architecture Board, said Permit 1000 is one of the first products to conform to the IP Security Protocol in the new IP Version 6.

"That will facilitate interoperability with other IP Version 6-compliant products," he said.





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Workgroup Computing

Poland's railways get COOL on finances

By Tim Ouellette

Though still struggling to modernize its economy, Poland is automating its railway system's finances in a big way.

In a \$7 million deal with Compucon Software, Inc. in Rutherford, N.J., the Polish State Railways System is installing Compucon's client/server financial software, headed by the vendor's Computer Output OnLine (COOL) system that manages mainframe-based reports and makes them readily accessible.

Up to 7,000 of the railway's 350,000 employees will access the system, mostly from remote locations. It will be housed on 10 Digital Equipment Corp. Alpha servers throughout the country.

"Poland took a big step to joining the free market, now we have to join Europe as quickly as possible," said Mariusz Zielenkiewicz, deputy finance director and project manager

at the railway.

Poland must meet various requirements to join the European Community by 1997, one of which is to upgrade the management of its railway system. Currently, all financial information is stored on microfiche, making research and decision-making a slow and tedious affair for finance employees.

Financial automation

"All the information going to the management level is delivered by post and comes printed on a piece of paper," Zielenkiewicz said. "It is always difficult to get."

COOL will put this data online. The system's server software writes and indexes hot batch reports to optical disc, replacing the traditional green bar reports or microfiche. The client software lets users search, select and output the data stored on disc faster than they could with microfiche.

"There is a cost reduction with eliminating microfiche and

time delays, but the advantage of the enterprise access is the immediate access to electronic

reports," said Mason Grigby, principal at Output Strategies, Inc. in San Francisco.

Because COOL stores compressed data instead of the full image of a report, users can query and download the indexed data faster, while taking up less bandwidth on the railway's own X.25 network.

Handy features

Compucon also will analyze how users typically use the data, and it will prepare standard queries and COOL reports so that only the page of data the customer requires will come over the lines, said Scott Grisanti, product manager for COOL and workflow at Compucon.

Because COOL is independent of the financial system and shows a fast return on investment, Zielenkiewicz said he expects other uses for it. "It can be used in any part of the environment for the railroads," he said.

Universal mail-in-box closer for NetWare

By Sarah Mohan

Medieval knights had the Holy Grail. Modern workers are looking for a universal in-box that lets them find electronic mail, voice mail and other messages in one place. Users of Novell, Inc.'s NetWare may find this second myth a more attainable goal, thanks to a new product from CallWare Technologies, Inc.

CallWare, in Salt Lake City, recently introduced CallWare 5.1, software that lets users' PCs temporarily take control of the private branch exchange (PBX). This means voice messages can be manipulated from the desktop.

The product "brings the mythical universal in-box that much closer," said Josh Penrod, an analyst at Currid & Co. in Houston. With CallWare 5.1, users will be able to receive their E-mail, voice mail and faxes in one in-box.

The new release is a NetWare Loadable Module and integrates with GroupWise. Novell's collaborative computing platform that merges services such as E-mail, faxing and scheduling.

William Lew, operations manager at Purcell R. Hamlin Corp., a hydraulic components manufacturer in Houston, is using Version 5.0 of the product and is set to upgrade to the newest version.

"This allows us to screen incoming calls and see which department a particu-

lar caller wants," Lew said.

The easy-to-use system will gain more features in the next release. When GroupWise XTD, Novell's next-generation client/server groupware offering, rolls out at the beginning of next year, it will add SoftSolutions 4.1 document management and CallWare Share discussion databases to about 250 clinical and about 1,000 administrative electronic forms, said Jay Fleiter, health information manager at the West Palm Beach, Fla., hospital. However, some areas still require paper transactions (see chart).

Integration with NDS means network managers can administer CallWare and NetWare users at the same time.

CallWare runs in a NetWare 3.x or 4.x environment. It needs a voice processing card from Rhetorex, Inc. in Campbell, Calif., that interfaces to the company's PBX. The connection between the NetWare server and PBX is over a 9.6K bps line, and CallWare supports up to 190 types of PBXs. It can handle a maximum of 64 telephone lines simultaneously.

On the client side, the company has enhanced its relatively new graphical desktop software, CallWare ViewPoint, which was first released in January. ViewPoint lets users view their voice messages on the computer screen. The new version of ViewPoint adds subject fields, notes fields and the ability to create distribution lists.

Pricing starts at \$2,995 for 25 users

Hospital takes paperless route

By Tim Ouellette

Four hundred beds, 150,000 outpatients and not one scrap of paper.

At least that is the hope of the West Palm Beach Veteran's Administration Medical Center, which opened its doors in June with the goal of automating its paper processing with electronic forms.

All medical records and associated paperwork have been

distilled down to about 250 clinical and about 1,000 administrative electronic forms, said Jay Fleiter, health information manager at the West Palm Beach, Fla., hospital. However, some areas still require paper transactions (see chart).

Ready access

Fleiter worked with custom design software, Visual Basic, the help of a systems integrator and input from the medical staff to develop clinical forms. The forms can be accessed from PCs in each screening room and nursing station to the hospital.

The electronic forms now let doctors point and click to enter results of any type of examination or issue a prescription. All entries require an electronic signature — which uses a special access code known only by the person signing

— for approval and entry into the medical record.

The slew of administrative forms that come with being a government entity were prepared with the help of software from JetFirm Corp. in Ottawa.

In-house scanning of existing medical records and documents from outside the hospital has been a problem, Fleiter noted, because outsourcing would have

Now you can read what the doctor writes

While the West Palm Beach Veteran's Administration Medical Center has gone paperless by putting its medical records on-line with electronic forms — including prescriptions — there are a few areas where paper still reigns to head.

Operation consent forms, which must be printed to get a patient's signature. Light pen technology is expected to soon make this paperless.

Paper policy manuals (expected to be available on-line soon).

Items, including echocardiograms, which still print out before the results.

Pricing records for release to insurance companies or hospitals, although this no longer requires a records clerk.

been cheaper and relieved the hospital of the costs of buying hardware that is nearly outdated after less than a year.

And while the paperless system has reduced physical file storage costs by about \$500,000, the 900 hospital employees did require training. But after two to four weeks on the system, doctors and nurses have gotten the mouse movements down pat, Fleiter said.

COMPUTERWORLD SEPTEMBER 4, 1995

Workgroup Computing

NovaSoft Systems, Inc. has announced NovaManage, a product for Digital Equipment Corp.'s AlphaServer systems.

According to the Burlington, Mass., firm, NovaManage is an enterprise-wide document and workflow management software. It enables large organizations with hundreds of users to manage millions of documents throughout a system.

NovaManage features Cellular Document Management tools to give each department its own overview of needed documents with customizable tools.

Digital's AlphaServer machines can fit into client/server networks containing supported NovaManage platforms. Those include Digital's OpenVMS and Digital Unix; Microsoft Corp.'s Windows; IBM's AIX and OS/2; Hewlett-Packard Co.'s HP-UX; and Sun Microsystems, Inc.'s Solaris.

Pricing for a 10-seat license of NovaManage starts at \$45,000.

► NovaSoft Systems
(617) 221-0500

ComputerVision Corp. has introduced Optegra Total Data Management, an object-oriented data management product.

According to the Bedford, Mass., company, Optegra Total Data Management gives transparent on-line access and control over data to all connected users. The product was designed to give all users the ability to store, search, retrieve, manipulate and distribute any type of information in a system.

Optegra Total Data Management includes the following modules: Optegra Vault, Optegra Locator, Optegra Navigator, Optegra Scan/PC and Optegra View/PC.

Pricing for Optegra Total Data Management starts at \$20,000.

► ComputerVision
(617) 275-1800

Workflow Technologies, Inc. has introduced Innovation Team Project, a project management product.

According to the Scottsdale, Ariz., company, Innovation Team Project is a collaborative, workflow-enabled, platform-independent project management system that is built in Notes and works with Microsoft Corp.'s Project.

Innovation Team Project allows scheduling and resource management across single or multiple groups and companies and instant accessibility to all project information from multiple locations. The product automatically creates detailed project schedules from template time lines along with project calendars containing work schedules. It has workflow-enabled requests and responses with time recording, cost accounting and report generation for projects.

Pricing for Innovation Team Project starts at \$315 for individual licenses and \$695 for a three-client/one-server package.

► Workflow Technologies
(602) 867-5078

Stac Electronics has introduced CD-QuickShare, a software-only CD-ROM server product for networked and remote Windows users who need simultaneous access to CD-ROM-based information.

According to the San Diego company, CD-QuickShare lets network users share any number of CD-ROMs at hard-disk speeds. Using a single CD-ROM drive, it stores compressed CD-ROM data on available disk space, turning a net-

worked hard drive into a CD-ROM server. The product builds a library of compressed CD-ROM images on the server so the whole network of Windows users can access the data at once.

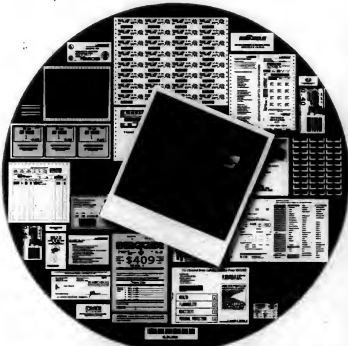
CD-QuickShare has two applications designed to simplify the administration and use of the shared CD-ROMs. The CD-Administrator provides a facility for loading and managing CDs on the network from a single, central location. The CD-Selector gives users instant ac-

cess to a list of CDs, all under a single drive letter.

CD-QuickShare ensures broad compatibility with all network file servers, including Novell, Inc.'s NetWare, Microsoft Corp.'s Windows NT, Banyan Systems, Inc.'s Vines and IBM's OS/2 LAN Server.

Pricing for CD-QuickShare starts at \$500 for a concurrent, five-user license.

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Weaving a Web site

Matching goals to technical prowess key to success

By Kim S. Nash

If you think you can build a World Wide Web site based on your company's annual report and an electronic-mail address, sit down and listen to the masters.

Webmasters, that is. Information systems staffers and/or marketers with experience planning, designing and redesigning corporate Web sites have discovered the hard way that some of the best tricks for getting on-line users to a site have heavy technological implications.

Companies that don't take their Web sites seriously or try to get away with one-time-only Web projects waste time, said Dave Clauson, a senior vice president at the San Francisco-based technology group of the advertising agency Foster Coase & Belding.

"All the corporate brochures out there that pass for Web sites are going to be re-evaluated or not visited," Clauson said.

No one-shot deal

In fact, the webmaster's job is never done. Several experienced webmasters said it is normal to completely redesign a site every six months.

Web users are bored easily by the same old stuff, and a stagnant Web site will lose its audience quickly, they explained.

Godiva Chocolatier, Inc., for example, is on its second redesign since launching its Web site last December. In its second face, the Godiva site switched from a lot of blue Hypertext Markup Language text links to navigational bars for users to click on. The bars are easier to spot and understand for casual Web visitors, said Adam Rockmore, webmaster and market-

ing manager at Godiva in New York.

Los Angeles-based TicketMaster's site is even more grueling for its technical staff. The New York-based ticket seller refreshes the information at its site four times per hour. Every 15 minutes, users can peruse new information on everything from Broadway plays to wrestling matches.

Changing faces

"It's pretty dynamic," said Bob Perkins, TicketMaster's vice president of on-line services.

The company has already redesigned its 2-month-old home page. Another overhaul is in the works for the end of the year, Perkins said.

Even relatively mundane technologies such as E-mail can pose problems for webmasters.

Nissan Motor Corp., for example, wasn't ready to open a two-way E-mail exchange with its constituents when it launched its site in June, said Robyn Street, IS manager at Nissan in Carson, Calif.

Instead, the automaker created a button for visitors to click on to request brochures. But users can't initiate a dialogue with Nissan.

"We want to do two-way communication, but we're not prepared to do it immediately because of [staff] head count and cost considerations in doing it right," Street said.

She declined to estimate how much money Nissan would have to spend to make E-mail with customers viable.

Until Nissan is ready to take on the load, its advertising firm, Chiat/Day, Inc. in Venice, Calif., handles messages—an average of 12 per day—

from those Nissan customers savvy enough to figure out how to contact the car company electronically.



World Wide Web wisdom

Users who have been there advise webmaster wannabes to ask themselves and other company executives key questions before bursting onto the Web.

- Who do we want to attract to our Web site: existing customers? New customers? Any on-line clients?
- How interactive will the site be? How can we balance informational material with activities on the site?
- How much traffic can the Web server hardware and software handle?
- What guidelines will we use in linking our pages to other Web sites? How much content do we want of content associated with our site?

Waiting for ATM? Users can look at other options

By Neal Weisberg

SMDS, the Rodney Dangerfield of high-speed data transmission services, is finally starting to get some respect.

Switched Multimegabit Data Services (SMDS) is a way of shooting data at speeds from 50K bit/sec. to 34M bit/sec. across multiple sites over the public phone network.

Available since 1991, SMDS has been overshadowed by the hype about Asynchronous Transfer Mode (ATM). Only about 200 customers in the U.S. use SMDS.

But a recent study by International Data Corp. in Framingham, Mass., predicted that number will increase markedly in the next few years as users realize they don't need to wait for ATM. With SMDS, they can get high-speed data

transfer now, and they can still migrate easily to ATM.

Proponents of SMDS say it is easier to install and manage than frame relay, and it is an ideal stepping-stone to ATM because it is based on the same 50-byte cell architecture.

Joe Bumbulis brought SMDS to 3M Co. in St. Paul, Minn., where he linked the headquarters to an accounts payable facility and an engineering center, each several miles from the home office.

Bumbulis said he selected SMDS because ATM simply wasn't ready for prime time. "SMDS is just so nice," he said. "It's so simple, and it works."

He said SMDS's growth has been stunted because service providers and users have been patiently waiting for ATM.

Cabletron, partners expand management options

Upcoming software will expand Spectrum capabilities from network elements to systems and applications

Vendor	Ship date	Product name	Description
Cabletron Systems, Inc.	Q4 1995	Management Gateway Server for Hewlett-Packard	Manages users, files and resources on Hewlett-Packard servers
	Q4 1995	Oracle Monitoring Module	Monitors Oracle database applications
Calypso Software Systems, Inc.	Q4 1995	Alpha Extensible Management System	Policy-based manager of distributed applications, stations and servers
Computer Associates International, Inc.	Q4 1996	Ch-Administrator	Shares alarms and console with full systems management applications
Gradinet Technologies, Inc.	Q4 1995	Universe Server Management Agent	Monitors software usage through IRIX software licensing systems
SageNet Technology, Inc.	Q4 1996	Laddinet	Manages NetWare domains
Threll Systems, Inc.	Q4 1996	Threll Enterprise Console	Shares alarms and console with full systems management application

Cabletron shifts attention to systems management

By Patrick Dryden and Steve Moore

Seeking credibility as a full-scale manager of enterprise network environments, Cabletron Systems, Inc. recently launched a promised suite of systems management tools for Spectrum, its distributed platform for monitoring internetwork links.

Partners promised tools that integrate with Spectrum's object database or at least its alarm and event handling. This would allow administrators who link Spectrum servers across wide-area networks to manage their network infrastructure—routers, switches and hubs—and clients, servers and applications.

One coordinated platform would handle it all, the vendors said.

One chose Spectrum because it's expanding from network man-

agement to include these types of functions," said John Bultman, corporate technology vice president at J. P. Morgan & Co. in New York. "It's becoming a full management platform like Hewlett-Packard's [x] OpenView and [IBM's] NetView."

Close, but no cigar

But Spectrum isn't yet a bullet-proof tool for managing all aspects of complex corporate networks.

This announcement answers questions and concerns about systems management, but users may not have a whole lot of choices initially," said Tim Wilson, management analyst at Decisive, Inc., a consultancy in Herndon, Va.

A few integrated systems management modules are available. Cabletron, page 58

The essence of SMDS

Features of Switched Multimegabit Data Services (SMDS) include the following:

- Sends data over WANs at speeds between 56K and 34M bit/sec.
- Uses 53-byte cell, fast-packet architecture—similar to ATM—but has advantage of not requiring point-to-point connection
- Often best used to connect multiple LANs within metropolitan area

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Tide rises for microwave technology

By Bob Wallace



Soon, the shortest path for linking LANs at two dispersed sites will be a straight line.

That is the promise of a new wave of products that use microwave technology to link LANs at native speeds (10M b/sec.) and at distances of up to 15 miles. The only prerequisite is a direct line of sight between locations.

Vendors such as Southwest Microwave, Inc. in Tempe, Ariz., and Microwave Bypass Systems, Inc. in Hingham, Mass., are for the first time announcing turnkey packages for linking LANs over microwave connections.

While microwave technology isn't frequently used to link LANs, there are plenty of places where it comes in handy.

"We have two buildings that we needed to link at native Ethernet speed and found that microwave would cost about \$20,000, while running private fiber between the sites would cost about \$100,000," said Gary Groves, a senior network analyst at Houston-Pandora Apache Oil Co. in Houston. "It was a no-brainer."

However, using microwave technology to link LANs has its drawbacks. Frequently, there is no line of sight between locations because of forests, high-rise office buildings and elevated business signs. Bad weather and long distances also can wreak havoc on signal and may require users to install expensive intermediate towers.

Nonetheless, industry analysts sang the praises of microwave, calling it a low-risk technology. "Microwave is definitely a time-proven technology, so IS managers won't have to worry about risks associated with less known and more complicated approaches such as running [land lines] that require expensive switching equipment," said Daniel Breri, president of TeleChoice, Inc., a Verona, N.J., consultancy. Still, many say microwave technology is experiencing an identity crisis.

"Everyone thinks that microwave [systems] are big, expensive and don't work very well," said Brandon Ames, president of Ames Office Automation, Inc. The Tempe, Ariz., company designs and builds microwave links and land-line networks for schools and government agencies.

"The only downside we've had was when a tornado twisted a tower," Ames said. Perhaps the biggest benefit of microwave technology is its low cost. If a company decides to use microwave equipment to link LANs, it buys the antennae and radio frequency modems for each site. That is a one-time capital equipment expenditure.

By comparison, if leased lines between sites are available, users pay a hefty on-site installation charge that can exceed \$1,000 per site and a monthly charge — usually several thousand dollars — for the actual line. The user never owns the link.

Places where microwave technology makes sense include the following:

- In major metropolitan areas where carriers can't easily provide land lines, which results in high prices.
- Under highways, bodies of water and in deserts where land lines often can't be run.
- To remote locations where land lines aren't always offered.
- For transmission speeds between 1.544M b/sec. and 45M b/sec.

Lines in between those rates aren't widely offered by carriers and may require equipment to build multiple T1 lines together.

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- For transmission speeds between 1.544M b/sec. and 45M b/sec.

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Briefs

Supermarket goes wireless

Kroger Co. in Cincinnati, the nation's largest supermarket chain, has chosen Telosys Corp. in Akron, Ohio, to supply a wireless data communications system for 1,200 stores, 34 manufacturing plants and 30 distribution centers. Using portable teletransmission systems provided by Telosys, Kroger will transmit information such as shelf price audits and product replacement. The systems will also be used to track inventory and orders in the distribution centers.

Cogent launches hubs

High-speed Ethernet adapter vendor Cogent Data Technology, Inc. in Fritch Harbor, Wash., recently launched a line of 100Base-T hubs and shipload packages the first 100Base-T adapter to support Category 3 unshielded twisted-pair (UTP) cable, the ubiquitous "phone grade" UTP. Both 10- and 24-port concentrators for building 100M b/sec. Ethernet LANs on Category 3 UTP will ship next month along with models supporting Category 5 UTP and fiber-optic cabling. The firm also will offer dual-speed Ethernet adapters with a built-in "T" connector to help migrate coaxial-based LANs from 10M b/sec. to 100M b/sec.

High-speed Sniffers

Network General Corp. in Menlo Park, Calif., intends to adapt its Sniffer line of protocol analyzers this fall to network troubleshooters can examine 100Base-T LANs and backbones. Network General will soon announce its partnership with a silicon vendor to outsource a "fast" Ethernet processor for capturing traffic at 100M b/sec. New high-speed analysis techniques, to be implemented first for "fast" Ethernet, will be extended to switched networks, including Asynchronous Transfer Mode operating at speeds up to 150M b/sec.

Upcoming IBM management

IBM plans to roll out in September remote monitoring options for its Internet working hardware to help administrators keep tabs on LANs distributed across enterprise networks. The probes will gather and report data on all Ethernet and Token Ring groups, according to a product manager.

The check's in the E-mail

Banks plan electronic payment system

By Thomas Hoffman

More than 20 major banks and technology companies recently announced plans to develop an electronic check-payment system focused over the Internet and other on-line services.

The system, scheduled to begin piloting next year, would enable consumers to pay bills and order merchandise on-line with electronic checks. To conduct electronic transactions, users would be required to purchase a PCMCIA card for \$30 to \$40. Desktop PC users must also purchase a PC card reader. The PC cards will hold user authorization information and digitized signatures, acting as electronic checkbooks.

An electronic check-payment system would be a boon for banks,

which currently spend more than \$50 billion a year to process more than 60 billion paper checks.

In addition, member banks hope the system will provide "a level of security and confidence currently found only in traditional banking products" to electronic commerce over the Internet, said Dan Schutzer, vice president of advanced technology at Citibank NA in New York and president of the Financial Services Technology Consortium (FSTC).

The FSTC, which formed in 1992, is a group of 60 banks, technology vendors, academic institutions and government agencies that sponsored research on technology projects — such as the electronic check-payment system — to benefit the financial services industry. Currently, only group members are participating in the electronic check initiative.

Last week's FSTC initiative will likely rival other forthcoming electronic payment techniques. For example, Visa International, Inc. and Microsoft Corp. plan to publish their Secure Transaction Technology specifications next month [CW, July 31].

But given the support of banking industry heavyweights such as Bank of America and Chemical Bank Corp., the FSTC electronic check-payment system "could become a de facto standard" for electronic commerce, said Julius W. Peake, a professor of finance at the University of Northern Colorado in Greeley.



Citibank's Dan Schutzer says he hopes the system will provide improved security.

Networking books offer help

• *The McGraw-Hill Internet Working Handbook* by D. Edgar Taylor, 773 pages, \$75.95.

Taylor, a consultant and author of numerous Internetworks and Netbooks, says he believes, among other things, that the Internet is here to stay. He covers the network from lower to upper layer. Working protocol by protocol, he explains how they work and interwork. The book includes a glossary and acronym.

• *Introduction to SNA, ATM and Professional's Guide to VTAM/INCP*, 2nd edition, by Jay Rana and George C. Sackett, 645 pages, \$50.

This book is designed to help readers move from SNA to Advanced Peer-to-Peer Networking (APPN). It discusses VTAM and Network Control Program (NCP) in the context of how to implement them in SNA and APPN environments. It explains which IBM hardware will work with APPN. Both authors have hands-on experience. Rana is an active president at Merrill Lynch and Sackett is a manager of network management at a consumer electronics company.



Enterprise Networking

Mitek Systems, Inc. has introduced NIF FaxShare, a Windows-based, open, scalable fax-server platform.

According to the San Diego company, NIF FaxShare lets users fax documents from within an application directly from a workstation over a LAN. Linking technology lets users attach any Windows application, graphics and photos can also be faxed.

NIF FaxShare also lets users receive faxes through the product's hand- and machine-printed character recognition capabilities and routes incoming faxes across a company's network to individual workstations.

NIF FaxShare supports DOS and Windows over any LAN with no memory requirement at the workstation.

A five-user starter kit costs \$695. It includes FaxShare, server software, a five-user license and support for one fax line.

► Mitek Systems
(619) 635-5900

Performance Technology, Inc. has unveiled Instant Internet 2.0, a hardware/software product that connects up to 50 concurrent sessions on a Novell, Inc. NetWare or Performance Technology PowerLan network directly to the Internet.

According to the San Antonio company, Instant Internet 2.0 features dual-Ethernet card support for enhanced security, multiple box support for increased capacity and fault tolerance and destination host blocking for added management.

The product also features multiple box support, which allows the installation of multiple Instant Internet units on a single LAN.

Instant Internet 2.0 includes options to control user access to destination hosts. The product also assigns individual users to one or more specific Instant Internet units, with connections attempted in a fixed or random sequence.

The standard Ethernet-based version of Instant Internet 2.0 costs \$2,495 per unit.

► Performance Technology
(310) 979-2600

SMDS

CONTINUED FROM PAGE 53

Widespread availability of ATM is still years away, but SMDS is here now, Bumbles pointed out.

And while ATM standards are still being hammered out, that process has been completed for SMDS. Bumbles is only partly right. While SMDS is available in most states and 50 major metropolitan areas, it still isn't available everywhere. Bumbles has taken a new job as a member of the technical staff at Microelectronic and Computer Technology Corp. in Austin,

Texas, and he can't get SMDS from Southwestern Bell.

In fact, SMDS availability is spotty among regional Bell operating companies. And among the major long-distance carriers, only MCI Communications Corp. offers it.

LA Dye and Print Works, a Los Angeles textile operation, has used SMDS for nearly two years, said systems analyst Doug Hansberger. The advantage of SMDS is that it is "connectionless," which means the systems manager doesn't have to set up and manage the point-to-point connections required by frame relay, he said.

Kathryn Korostoff, an analyst at Sage Research, Inc. in Natick,

Mass., said SMDS is slowly shaking off its initial image as a very high-speed, expensive service. Prices have come down considerably, she said.

One of the earliest adopters of SMDS was Kaiser Permanente Health Plan, Inc.'s Northern California region. The health maintenance organization serves nearly 2.4 million members and operates 18 hospitals and 29 clinics.

Carl Pelt, network development supervisor at Kaiser, said he went with SMDS three years ago and uses it to connect multiple LANs. SMDS provides the company's wide-area network infrastructure for Lotus Development Corp.'s Notes and is the backup system to Kaiser's extensive microwave telephone network.

Pelt said meshing frame relay to all of his sites would have been "an administrative nightmare."

How much will it cost?
A typical SMDS rate would be a one-time installation charge of \$700 to \$1,000 per network interface, plus a flat-rate tariff of \$350 to \$750 a month.

Cabletron

CONTINUED FROM PAGE 53

now, but this set won't be complete until the second quarter of next year. Specific customers demand these options, acknowledged officials at Cabletron in Rochester, N.H.

Despite a major effort to compete directly with HP and IBM on integrated network and systems management, "it will take Cabletron a year or two to credibly present themselves as having the same skill sets and support capabilities," said John Morency, principal consultant at The Registry, Inc. in Newton, Mass.

"Cabletron isn't there yet in terms of really understanding the systems management piece, especially PC networks in terms of license and security management," he said. "They are hoping their partnerships will bring that to the table."

Bullivant said he wants tools that tightly integrate with Spectrum to help manage nearly 20,000 PCs, Macintoshes and Unix workstations.

"Those tools that integrate the cleanest and deepest with Spectrum will have the best chance to help us address our management holes," Bullivant said. "Now these vendors have to show serious integration efforts. We want to see more than paper agreements."

Added features

Most announced systems management options integrate with Spectrum's alarm and event-handling capabilities. A few add attributes for a station or database, for example, directly to Spectrum's object database. This creates more complete network modeling.



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IT CAME BACK AS A STORAGE UNIT

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County's IS takes its applications to market

By Julia King
TACOMA WASH.

Pierce County's information systems department here had no intention of becoming a software vendor when it embarked on a simple client/server pilot project early in 1992.

But nearly 3½ years later, its suite of 16 applications has found ready buyers in other government agencies. These applications range from a countywide purchasing system with 2,900 users to Linux, a legal case management system that

All of the applications were developed using Powersoft Corp.'s PowerBuilder tools and Sybase, Inc. databases.

The other development component common to all 16 systems was an unprecedented level of user involvement.

The \$100 million Linux system, for instance, was designed by three users from the prosecutor's office, Office of Assigned Counsel and Superior Court, who worked with IS staffers on a dedicated, full-time basis for a year.

"People in these offices trust the system will meet their needs because one of their own has built it," said Larry C. Genelius, Linux project leader.

Sharing the load

Prior to Linux, users in all three of these legal branches kept separate records on separate systems even though all three were tracking the same cases. Under Linux, data is entered once, then shared by users in all three departments. For instance, court calendars can be accessed by judges or attorneys for both the prosecution and defense, all from the same database.

In 1994 under Linux, data entries totaled 198,556 for the three departments. Under the previous system, the number would have totaled just under 600,000, according to Sue Vioch, administrative manager at the prosecutor's office.

Vioch said the system has also enabled her office to live to the letter of the constitution, which requires that prosecutors notify victims of all court dates and other events pertinent to a case. This typically involves sending out 150 to 200 letters a day; that process has been automated under Linux.

Before Linux, "this was done manually or not at all," Vioch said.

Automating countywide purchasing under a single client/server system known as Pops has also helped significantly streamline the buying process. The system cost \$600,000 to develop.

For instance, thanks to a link between the Pops application and other financial databases, Pops has access to budget data and will process only those orders for which money is available.

Also, IS can check to see that competing purchases conform to countywide standards because hardware and software purchase orders are routed to IS as part of the approval process.

S/390 clustering in start-up mode

By Craig Stedman

IBM's mainframe clustering technology, called parallel sysplex, is starting to come into full flower. That should make it possible for the sysplex concept to take root beyond the small number of early adopters who use it today.

However, widespread implementations of full-fledged sysplexes won't start until late this year or 1996, mainframe users and analysts said. One key parallel sysplex feature allows clusters of mainframes to share common pools of data. But this data sharing support between mainframes still has to be added to key products such as IBM's DB2 database and VSAM flat-file software.

A DB2 release with data sharing is due in November, and IBM said a VSAM update should follow early next year. But even then, sysplex adoption will be governed by the willingness of customers to upgrade their System/390s to those products and recent releases of the MVS operating system and other mainframe software (see box).

Such upgrades are often done one product at a time, with several months of testing in between to isolate any problems, users said. "That's going to be our big delay in really taking advantage of the parallel sysplex environment," said

Michael Puley, manager of resource management at Barnett Banks, Inc.'s information systems unit in Jacksonville, Fla.

Barnett plans to put a partial parallel sysplex in place in October to link its two ES/9000s and one of IBM's new air-cooled System/390s based on CMOS microprocessors. Even the partial implementation should improve availability because applications will be able to move to another processor when a system crash or planned downtime occurs, Puley said.

But getting to the sysplex-enabled versions of DB2 and IBM's DBS database and CICS transaction manager probably won't happen until 1996, he added. Barnett is also uncertain when it will start testing IBM's Workload Manager, which assigns processing tasks to the different mainframes in a sysplex. "It's like we're building a bridge and only 100 cars are going to go over it the first day," Puley said.

Manager, which assigns processing tasks to the different mainframes in a sysplex. "It's like we're building a bridge and only 100 cars are going to go over it the first day," Puley said.

First stage

Sysplex technology has been available from IBM for several years, but it was originally limited to functions such as synchronizing system clocks. The parallel version with data sharing was introduced early last year and just became reality when DB2's 1 shipped last spring.

Full-fledged parallel sysplexes are in production at fewer than a dozen sites, including test sites for the upcoming DB2 release, said William Reedy, director of marketing at IBM's System/390 Division.

Charlie Burns, an analyst at Gartner Group, Inc. in Stamford, Conn., predicted that number will increase to about 50 sites by year's end and several hundred by next August. Besides the software issues, customers were also waiting for a second generation of IBM's 6872 air-cooled mainframes that shipped in late July, he added.

EDTEL, Inc., a telephone company in Edmond, Okla., is one of the first customers to use S/390, page 65



Pierce County's IS director Terry Hale: "We decided to start selling the applications after we saw that the products on the market weren't as good."

this year will track just under 47,000 court cases.

The state fish and game department in Washington is now implementing Pierce County's client/server-based Train system to track employees' participation in training programs. And late last month, officials from neighboring Clark County came to Tacoma to test-drive the Linux system.

A different way

"We decided to start selling the applications after we saw that the products on the market weren't as good as what we had in-house," explained Terry Hale, Pierce County's IS director.

As a government entity, the county is by law prohibited from earning a profit when selling the software. So instead, it "transfers" a system license along with the application source code to buyers, who pay fees ranging from \$4,000 to \$350,000, depending on the application. These fees, in turn, help defray Pierce County's multimillion-dollar development costs.

Pieces of the puzzle

The following mainframe hardware and software are required to set up a parallel sysplex:

PROCESORS	CLUSTERING HARDWARE
• 6874 air-cooled mainframes • ES/900 524 and 734 series	• Stand-alone 6874 supplying facility • Dedicated CPE on a participating mainframe
SOFTWARE	
• Operating system - MVS/ESA 5.1 or higher • Communications - VTAM 4.3 or higher • Storage management - DFSMS 1.2 • Transaction manager - IMS 5.1, CICS 6.1 or higher • Resource manager - RRS 5.4, RRS 6.1, Software AG's Adapt-2	

*Scheduled to ship later this year

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Large Systems

Briefs

Sybase expands line

Sybase, Inc. has started beta testing Sybase IQ, a specialized database engine that Sybase inherited in its October 1994 acquisition of Boston-based Enterprise Technologies Corp. The product, which is due to ship late this year, is aimed at data warehouse users. The Berkeley, Calif., database company also announced joint marketing and engineering pacts with 30 warehousing tool vendors, including query product maker PDI Software, Inc., a unit of Dun & Bradstreet Corp., and multidimensional database company Keweenaw Technologies.

Pair links products

Management Group, Inc. will link its supply chain management software to SAP AG's upcoming Release 3.0 R/3 client/server system under a recently announced joint development agreement. The interface between the companies' software is based on SAP's much-touted Application Link Enabling standard for application-to-application interoperability. The com-

panies are expected to demonstrate the capability at the SAP users conference in Phoenix this month.

Finance wars debut

Kaplan Software, Inc. has announced Business Process Integrator (BPI) and Financial Manager, software aimed at extending the life of financial applications for client/server architectures. BPI consolidates data from multiple systems and provides reporting, decision support and workflow. Financial Manager consists of financial business objects. A standard configuration from the Boulder, Colo., company costs \$185,000.

Wall upgrades Rumba

Wall Data, Inc. in Kirkland, Wash., recently introduced new versions of the PC connectivity software for IBM's DB2 databases with support for concurrent record-level data access by multiple users. The upgraded Rumba for Database Access products will also include new SQL querying capabilities, source code. The software is aimed at DB2 database running on IBM's AS/400, mainframe and RS/6000 product lines.

Global Software, Inc. has introduced Universal Financials 4.3.

According to the Raleigh, N.C., company Universal Financials 4.3 is client/server financial application software that integrates with other enterprise-wide systems. It supports desktop tools, including Microsoft Corp.'s Office and Lotus Development Corp.'s SmartSuite, and lets users extract enterprise-wide data for spreadsheet manipulation, analytical workbook processing, graphing, document managing or on-line analytical processing.

It has security features that are automatically invoked as data is pulled from the database into third-party tools. Individual security profiles follow each user to allow only authorized data access.

Universal Financials 4.3 features new modules in purchasing, decision support and event managing. The purchasing module includes best-practice forms across diverse industries and has a management top-down view of the life cycle from planning through contract renewal.

Universal Financials 4.3 is available on both mainframe and Unix platforms. Pricing for a single module starts at \$130,000.

► Global Software
(919) 678-7000

Information Advantage, Inc. has introduced DecisionSuite 3.0.

According to the Minneapolis company, DecisionSuite 3.0 is a business analysis application designed as an integrated suite of applications that lets users navigate, filter, compute, visualize and share live information and analysis.

DecisionSuite 3.0 includes four integrated applications: InfoAlert, NewsLine, Analysis and Workbench. InfoAlert delivers information, reports and alerts; NewsLine includes InfoAlert and gives users the ability to view and modify all assumptions behind the analysis; Analysis includes NewsLine and lets users navigate the data warehouse and publish filters, calculations, reports and report templates; and Workbench lets administrators manage resources and security.

InfoAlert costs \$195 per desktop, NewsLine costs \$395 per desktop, Analysis costs \$795 per desktop and Workbench costs \$295 per desktop. Pricing for the DecisionSuite server starts at \$45,000.

► Information Advantage
(612) 620-0700

Sequoia servers aim at rapid failure recovery

First Intel-driven units begin more distributed approach

By Michael Goldberg

Sequoia Systems, Inc. is aiming a new line of servers at users who want availability that reaches just shy of the fault-tolerant tag.

Don't look to the first low-end, single-processor models in the Sequoia Enterprise Server (SES) line to break any existing molds, however. Sequoia officials said the SES 100 and SES 110 models, with prices starting at \$5,000, are aimed at small and medium-size businesses that use a Sequoia version of the Pick database operating system. The SES 100 and SES 110 are available now.

Bell Marlboro, Mass.-based Sequoia said users will see the most important benefits of its new server line starting next year.

Executive vice president William Gould said that by mid-1995, Sequoia will show a multiprocessor server that can recover from a failure in less than one second. It will be powered by Intel Corp. Pentium chips and running either Microsoft Corp.'s Windows NT or Novell, Inc.'s UnixWare operating systems.

Sequoia's first seedlings

Sequoia's first line of servers are UnixWare-based servers running on a proprietary operating system designed for Pick database users.

PLANNED REPAIRS IN SEQUOIA'S SERVER LINE WILL BE FOLLOWING:

- Servers running UnixWare and Windows NT operating systems
- Servers using 30 and other future-generation Intel chips
- Symmetric multiprocessing models that scale up to 16 processors

Users pleased

Users said they were enthused to see Sequoia, whose servers run a fault-tolerant version of Unix, embrace a more distributed computing philosophy.

"It is very much interesting to me," said Jeff Bullock, director of administrative systems at HealthSource, Inc., a managed health care company in Concord, N.H., that has used Sequoia systems for five years without a crash. The company supports 1,500 users with two Series 400 systems, one with 14 processors and the other with 10.

Bullock said he wants to decentralize more of his computing environment. Running a new

server on UnixWare would decrease his concerns about its interoperability with other machines, he said. Bullock said he would compare the new Sequoia servers, which promise high availability instead of full fault tolerance, with the company's older line of computers.

Rough going

Sequoia is working to broaden its appeal beyond its Pick-dominated customer base but is entering an intense field of highly available

server vendors led by Hewlett-Packard Co. and Compaq Computer Corp., said Jim Johnson, president of The Standish Group International, Inc. in Dennis, Mass. Johnson said vendors play loose with terms such as "fault tolerance" and "high availability" in marketing their systems, so Sequoia will need to make its capabilities clear to users.

The use of Intel processors marks the first time Sequoia has used Motorola, Inc. chips and comes after the company's merger with Houston PC maker Texas Microsystems, Inc.

With a pair of linked Sequoia servers, one backing up the other, the company will promise to limit any system failures to less than one second through its fault management software and hardware, Gould said. "If one fails, it flops over to the other. It's an issue of hardware checkpoints," he said. While there weren't any price estimates available, a backup system would be cost effective compared with buying fully fault-tolerant hardware, he said.

Sequoia officials said they expect to unveil servers with two and four processors in October or November. When Sequoia introduces its "subsecond recovery" feature next year, customers can retrofit their servers to it.

S/390

CONTINUED FROM PAGE 63

Altera, combined an ES/9000 and one of IBM's initial 6872 models into a system last year. But it doesn't plan to start implementing data sharing with IMS, DB2 and the Workload Manager until late this year, said Rod MacLeod, an MVS systems programmer at EDEL.

The allure of data sharing is strong, MacLeod added. EDEL has already reduced system downtimes, "but that's not as completely transparent as it

Keeping cool

Parallel systems can be put together with just water-cooled ES/9000s, but most customers are expected to wait until they bring in IBM's new air-cooled System/390. "People aren't going to change their workloads and their system structures until they're motivated by a hardware change," said John Young, an analyst at The Clippinger Group, Inc. in Waterville, Me.

would be under a full parallel system," he said. The company also expects to be able to more easily move applications between mainframe processors to keep them from becoming either overloaded or underutilized.

Even relatively small mainframe shops are intrigued by the system concept. "If it works as advertised, you could do a lot of things that we have no way of doing right now," said Wayne Patton, director of data center operations at Kansas City Southern Railway Co. in Missouri. "Even for scheduled downtimes, you could move [applications] around on the fly."



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Application Development

CASE • LANGUAGES • TOOLS

Developers chart greatest hits

Benchmarking database may aid project managers

By Elizabeth Heichler

Several international volunteer user organizations are compiling an information base that may help software project managers with planning and benchmarking.

The organizations joined forces last year to form the International Software Benchmarking Standards Group (ISBSG). They are now gathering data from real-world software projects and pooling the results into one large database that all can share.

By searching for and analyzing information in the database, which contains details about actual software projects and how they were executed, software development managers will be able to benchmark their own team's performance against others, said Andrew Burg, U.S. national coordinator for the ISBSG. Managers will have information they can use when planning projects and estimating needed resources, he added.

The database service will be free of vendor bias, according to the nonprofit, volunteer software professionals organizations running it. The service will also

Glossary	For more information
Function point —An artificial measurement of the size of a software system. It emphasizes the functions being delivered in software, rather than the technology being used to implement those functions. Examples include reports and on-line screens. Using function point analysis, it is possible to measure the size of a software system by measuring the functionality being delivered to the user.	To find out more about the International Software Benchmarking Standards Group's efforts to compile a database of software development productivity data or to let the organization know you'd like to participate, contact Andrew Burg (Andrew.Burg@Sprint.Com) or an ComputerServe at 754.363.3470 or David Longmire (David.Longmire@Sprint.Com) at ComputerServe at 754.372.4370. Longmire will be the guest at the CASE Summit on Case-Based SD CASE in September.

be free to organizations that contribute their own software benchmark data by filling out a questionnaire about their software projects. Participating in the project is now the only way to gain access to the database.

The International Function Point Users Group (IFPUG), the largely North American contingent contributing to the ISBSG effort, plans next month to launch a World Wide Web site, where software professionals can find more information about the service and data collection forms. Once the database reaches a critical mass of content in the next year or so, people should be able to look for more than just how their own productivity

matches up to others in their industry, said Frank Mazzocco, total quality manager at Texas Instruments, Inc. in Plano, Texas. "Hopefully, there will be enough information in the database so that people will be able to identify critical success factors. The real value in benchmarking is benchmarking the process, not just the numbers," said Mazzocco, who is also president of the IFPUG.

Behind the global effort is an alphabet soup of international organizations, all focused on measuring software productivity. The U.S. branch of the IFPUG has started gathering information and has a database on 65 software projects that it will contribute to the ISBSG effort.

CA-Clipper workbench addition draws praise

By Thomas Hoffman

DOS isn't sexy. In fact, it is a lot like Cobi—millions of lines of code are still in use and will continue to be for years to come.

So when Computer Associates International, Inc. recently introduced the latest version of its DOS development system—CA-Clipper 5.3—many longtime Clipper users were anxious to begin using new programming features such as a Windows-based visual workbench to develop DOS applications.

Clipper-equipped

Computer Associates' CA-Clipper 5.3 Xbase development system includes the following features:

- Windows-based workbench for visual development of DOS applications
- Integration of the VGL version of Light LB Graphics from BPL Software, enabling DOS applications to have the look and feel of a GUI program
- Check boxes, hot boxes, scroll bars and other GUI objects
- Mouse support

"Most [developers] have attempted to create an integrated development environment of their own, so having the Windows workbench coupled with CA-Clipper is useful," said Mark Lincoln, a mathematical statistician at the U.S. Department of Labor's Bureau of Labor Statistics and president of the Washington Clipper user group.

Lincoln and other Clipper users said

they are generally pleased with the new graphics support and other features found in CA-Clipper 5.3 (see chart). But for all its bells and whistles, the latest version of CA's Xbase development system lacks several features that some users have been clamoring for, namely class creation and 32-bit support. Classes are user-defined data types or templates to create objects.

"I would have liked for [CA] to have included class creation, since it would be right there in the box instead of having to use a third-party tool," said Jim Tamburino, president of LMT Computer Service, Inc., a Marietta, Ga.-based consultancy and software developer that has been a Clipper shop since 1986. But Tamburino admitted he isn't interested in 32-bit support because his clients' systems "aren't there yet."

Nevertheless, users at CA's 1993 Technology developer's conference in Orlando, Fla., now have the two key features they "overwhelmingly" had lobbied for—the visual workbench and integrated development environment functionality, Lincoln said.

Marc Sokol, vice president of product strategy at CA, said CA-Clipper and other graphical user interface application development tools seeking 32-bit support and class creation should wait for CA-Visual Objects 2.0, the next version of the Indiana, N.Y., software giant's object-oriented programming environment. CA-Visual Objects 2.0 is expected to offer those features when it ships next spring. This won't be integrated with Clipper.

CA-Clipper 5.3 costs \$90 for registered developers and \$180 for first-time users.



Visual Companion kit points way

Developers can build geographic information system (GIS) features into their applications using a family of components from ObjectFX Corp. in St. Paul, Minn.

The Visual Companion Object Developer's Kit was designed especially for users of Paradox/Design, Inc.'s Smalltalk and includes components that provide geo-

graphic visualization and spatial analysis.

These can be integrated with corporate data so that users can make intuitive, point-and-click queries on data that has a geographic component, such as a customer's address. The kit will be available Oct. 1. Pricing begins at \$2,995. —Elizabeth Heichler

Computerworld Editorial Calendar

July - September, 1995

Issue Dates	Ad Closing Date*	Editorial Features & Custom Publications	Show Distribution & Ad Reading Study Issues
July 3	June 16	June 23 CW Guide To: PDAs Personal Digital Assistants, the latest evolution of microprocessor power in a small package, present unique buying options and support issues for IS organizations. This Guide will examine the leading products and tasks IS has in selecting and managing them. Buyers' Satisfaction Scorecard: Market leading PDAs Firing Line: Newest PDA from a leading vendor	
July 10	June 23	June 30 Closer Look: Unisys	Starch Study
July 17	June 30	July 7 CW Guide To: DBMS The focus of database management systems is as the server for a variety of applications. Depending on the application type, IS organizations face varied buying decisions. We will examine which database match which application needs best and analyze the leading products in each area. Buyers' Satisfaction Scorecard: Market leading SQL database mgmt. systems for midrange servers Firing Line: Latest DBMS from a leading vendor	
July 24	July 7	July 14 Closer Look: Power Macintosh	Enterprise Computing Chicago 7/26 - 7/28
July 31	July 14	July 21 CW Guide To: Workgroup and Collaborative Software Beyond e-mail and document management users are seeking products that help them manage business processes and work as teams. This Guide will examine how well the vendors are meeting this need. Buyers' Satisfaction Scorecard: Market leading workgroup software Firing Line: Latest collaborative product from a leading vendor	
Aug. 7	June 28	Computerworld Client/Server Journal Vertical Market Focus: Insurance Section Feature: Product Focus on Networking	Object World Networks Expo Interop + Network Unit Expo Harvey Study
Aug. 7	July 21	July 28 Special Report: Re-engineering the Workplace	
Aug. 14	July 28	Aug. 4 CW Guide To: Desktop Databases Personal databases that act as front ends to company applications and DBMSs, as well as PC-based packages that serve the needs of workgroups or departments will be examined with the focus on IS buying decisions. Buyers' Satisfaction Scorecard: Market leading desktop database Firing Line: Latest DBMS from a leading vendor	Object World San Francisco 8/15 - 8/17
Aug. 21	Aug. 4	Aug. 11 Closer Look: Sun Workstations	
Aug. 28	Aug. 11	Aug. 18 CW Guide To: Client/Server Financial Applications One of the first applications companies move off of the mainframe is financials. But only recently have the vendors begun producing true client/server offerings. We'll look at how users like them and what more they need. Buyers' Satisfaction Scorecard: Market leading client/server financial software Firing Line: Latest client/server financial software from a leading vendor	Starch Study
Sept. 4	Aug. 18	Aug. 25 Special Report: Annual Salary Survey	
Sept. 11	Aug. 25	Sept. 1 CW Guide To: Internetworking Routers and Hubs Facing competition from many areas, routers and hub vendors are adding capabilities and repositioning themselves. How do these changes affect IS buying plans and what is the future internetworking product set? Buyers' Satisfaction Scorecard: Market leading hubs and routers. Firing Line: Latest hub or router from a leading vendor Custom Publication: Object Application Awards Supplement	Networks Expo Dallas 9/12 - 9/14 Starch Study
Sept. 18	Sept. 1	Sept. 8 Closer Look: Client/Server Manufacturing Software	
Sept. 25	Sept. 8	Sept. 15 CW Guide To: ATM Switches ATM is becoming more widely installed and product offerings are multiplying. What are the benefits and costs of this new high-performance technology? Firing Line: Latest ATM software from a leading vendor Custom Publication: White Paper on The Business Case for Client/Server (part 3 of 4-part Enterprise Software Directions Series)	Interop + Network Atlanta 9/25 - 9/29 Unit: Expo, New York City 9/26 - 9/28

Editorial contacts (508) 879-0700 Management Features: Allan Altar, Closer Look: Johanna Ambrosio, CW Guide To: James Connolly, Buyers' Satisfaction Scorecard: James Connolly, Firing Line: Kevin Burden, Re-engineering the Workplace & Electronic Commerce: Joe Maglita, Computerworld Client/Server Journal: Alan Alper. Custom Publications are written independently of the Computerworld editorial staff. For more information on Custom Publications, contact Carolyn Novack at (508) 879-0700.

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Computerworld Editorial Calendar

October - December, 1995

Issue Date	Ad Closing Color* Bill	Editorial Features & Custom Publications	Show Distribution & Ad Readership Study Issues
Oct. 23		Computerworld Client/Server Journal Vertical Market Focus: Transportation Section Feature: Product Focus on Database Tools	Software Developers' Conference SIM Fall Conference Harvey Study
Oct. 2	Sept. 15	Oct. 22 Closer Look: Lotus Custom Publication: White Paper on Manufacturing Technology: Managing for Change (part 3 of 4-part Manufacturing Series)	Software Developers Conference Washington, D.C. 10/3 - 10/7
Oct. 9	Sept. 22	Sept. 29 CW Guide To: Large Scale Servers Mainframes, massively parallel multi-processors and supercomputers have their place in large corporations where data and applications require enormous processing power. How do the leading products shape up in this category and how much flexibility do they offer IS? Buyers' Satisfaction Scorecard: Market leading large scale systems Firing Line: Latest large scale system from a leading vendor	
Oct. 16	Sept. 29	Oct. 6 Closer Look: ISDN Update/Frame Relay	Starch Study
Oct. 23	Oct. 6	Oct. 13 CW Guide To: Network Operating Systems As operating systems take on more management capabilities, the buying decision changes. IS managers must look at the benefits of increased functionality and the trials of implementing it. What are the NOS trade-offs? Buyers' Satisfaction Scorecard: Market leading LAN operating systems Firing Line: Latest LAN operating system from a leading vendor	SIM Fall Conference Orlando, FL 10/22 - 10/25
Oct. 30	Oct. 13	Oct. 20 Closer Look: PC Storage Special Issue: Campus Edition (Issue 10/31)	
Nov. 6	Sept. 27	Computerworld Client/Server Journal Vertical Market Focus: Brokerage Section Feature: Product Focus on Development Tools	Comdex Fall Mobile World Client/Server World DB Expo Harvey Study
Nov. 13	Oct. 27	Oct. 3 CW Guide To: Object-oriented DBMS and Development Tools Is object-oriented the next wave in DBMS or is it an embedded technology that will gradually simply add functionality to present offerings? This question and how it affects IS buying decisions will be examined. Buyers' Satisfaction Scorecard: Market leading object-oriented DBMS Firing Line: Latest object-oriented DBMS from a leading vendor	Starch Study
Nov. 20	Oct. 3	Oct. 10 CW Guide To: Desktop PCs Pentium, PowerPC and other platforms will be examined with regard to the migration issues and performance gains they provide. Buyers' Satisfaction Scorecard: Market leading desktop PCs Firing Line: Latest desktop PC from a leading vendor	Comdex Fall Las Vegas 11/13 - 11/17
Nov. 27	Oct. 10	Oct. 17 Special Report: Electronic Commerce	
Dec. 4	Oct. 17	Oct. 22 Closer Look: Internet Browsers	Mobile World Boston 11/28 - 11/30
Dec. 11	Oct. 22	Oct. 1 Closer Look: Visual Development Tools Custom Publication: White Paper on Service Solutions for Client/Server (part 4 of 4-part Enterprise Software Directions Series)	Client/Server World Chicago 12/5 - 12/7 DB Expo New York City 12/5 - 12/7 Starch Study
Dec. 18	Oct. 22	Oct. 1 CW Guide To: Messaging Software and E-mail With e-mail going through a major architectural change to client/server, the market will have a very different shape. IS should be able to purchase products that better address company needs. Buyers' Satisfaction Scorecard: Market leading e-mail software Firing Line: Latest e-mail package from a leading vendor Custom Publication: White Paper on Manufacturing Acquisition Strategies: A Guide for User Empowerment (part 4 of 4-part Manufacturing Series)	
Dec. 25	Oct. 22	Oct. 1 Closer Look: Contact Management Tools	
Jan. 2	Oct. 22	Oct. 15 Annual Forecast Issue (1996 issue)	

* Includes ads within special editorial features and premium positions. * Please note early advertising close.

Management: Special Report

COMPUTERWORLD'S 9th ANNUAL

SALARY \$ SURVEY

Unequal opportunity

IS salaries are on the rise,
but women have yet to break through the glass ceiling

BY ALAN R. EARLS

Continued from Cover 1

Reaction to the Computerworld Salary Survey results divides along gender lines.

"I'm not surprised to hear it," says Lydia Volaitis, a GTE researcher in Needham, Mass., in response to Computerworld's finding of below-average numbers of women in many IS positions. Volaitis is part of a Boston-area group called The Initiative that helps women build careers in technical fields.

Marcia Radosevich, president and chief executive officer of HPR, Inc., a Boston-based software company, agrees that IS organizations are as prone to discrimination as any other type of organization. However, she says, "Things will get better not through regulation but through making management more enlightened." To hear men tell it, management has already seen the light.

"As far as compensation between males and females go, we see no difference," insists Doug Pedersen, director of human resources at Omaha-based Warner Enterprises, Inc. "One of my top project leaders is female, and she is also one of the best paid."

Bob Abbott, a senior partner at Pacific Coast Recruiting in Los Angeles, echoes Pedersen: "We don't see any difference between the male and female job candidates that get hired through us."

Still, Abbott admits there is a glass ceiling. "There are few women that have graduated to senior management, but we don't see that as a double standard. It is just a gap that may persist, perhaps for a generation," he says.

Good-bye old boys

George Mitchell, a consultant at ExecuComp Systems, a Norwell, Mass.-based company that studies compensation trends in technology-based industries, insists that the IS profession is well on its way to gender neutrality. Promotion, he says, is based on talent rather than the Old Boy network. "Constantly changing technology gives more opportunities for individuals to develop quickly and build a career," Mitchell says.

Mitchell agrees that the so-called "Mommy Track" is less of a problem in computer fields. "Women in these careers can often work at home or stay in

touch with their profession even if they choose to take more time with a family," he says.

Lore Balkan, executive vice president at the Data Processing Managers Association in Chicago, agrees with Mitchell that there is a strong orientation in IS toward rewarding skill and initiative. That, she says, may make IS more attractive to talented women in the future.

Survey highlights

Despite the persistent gender gap, both sexes made above-average salary gains last year. In fact, 1994 was a year in which the pie got bigger, in virtually every IS job category. While the Department of Commerce figures show wages and salaries for other professions rose by just 3% in the 12 months ended in June 1995, Computerworld Salary Survey data shows that IS salary increases averaged 4.5%. Overall IS salary growth even outpaced other fields including engineering, sales and human resources.

The 1995 Salary Survey also reveals a significant salary spread between small and large firms for many IS jobs. At the CIO level, salary differences between large companies (over \$500 million) and small companies (under \$100 million) exceeded \$55,000. Other director-level positions averaged \$30,000 differences between large and small companies; pay differences in other IS jobs ranged anywhere from a few thousand dollars to \$15,000.

Dennis Hardeland, manager of IS recruiting at Sears Merchandise Group in Chicago, says the pay differential comes directly from the scale of the enterprise and the need to compensate talented people able to perform tasks such as complex network management.

However, Mitchell questions that assumption, noting that it may be simply a matter of big companies having deeper pockets. "Smaller companies need those top skills just as much as large companies," he says.

Indeed, smaller companies are doing their best to close the pay gap, according to Computerworld's survey. Salary increases for small companies averaged 4.7% last year, compared with 4.5% for large companies.

Earls is a freelance writer in Franklin, Mass.



Illustration by [illegible]

1995 Salary Survey

► INSIDE:

For more results from our 1995 Salary Survey, see charts on pages 72, 74 and 78.

Pay hikes

IS salary increases outpace other professions'. Increases in the Northeast lead the way.

How IS compares: 1994-95
IS average 4.5%

Other professions:

Human resources	4.2%	Marketing/sales	3.1%
Administrative services	3.7%	Engineering	3.1%
Finance	3.4%		

Average IS salary increase by region

	Northeast	Midwest	South	West	Average
1994-95	5.5%	4.1%	4.5%	4.4%	4.5%
1993-94	4.9%	4.0%	4.5%	4.0%	4.2%

Average IS salary increase by company size

	Less than \$100M	\$100M to \$500M	Over \$500M
1994-95	4.7%	4.8%	4.2%
1993-94	4.3%	4.3%	4.1%

Best and worst industries for salary increases

1994-95	BEST: Retail 8.2%	WORST: Government 3.1%
1993-94	BEST: Business services IS 7.3%	WORST: Government 3.3%



Job hopping

IS turnover is lower than the national average for all professions

How IS turnover compared in 1994

IS turnover	8.7%
Total U.S.*	12.0%

Average turnover rate in 1994 by region

	Northeast	Midwest	South	West	Average
IS department	9.8%	7.9%	7.9%	10.1%	8.7%
Companywide	10.3%	11.2%	16.8%	13.0%	12.1%

Average turnover rate by company size

	Less than \$100M	\$100M-\$500M	Over \$500M
IS department	7.9%	8.8%	8.5%
Companywide	11.7%	13.1%	12.4%



Pay for performance
40%
of IS staffers receive bonuses based on job, IS department and company performance.

Wish list

IS professionals want to be rewarded for their performance. They'd also like some time off.

Benefit

	Would like	Currently offered
Performance bonuses	46.1%	39.5%
More vacation	41.3%	Not applicable
Telecommuting	40.7%	18.8%
Flexible hours	30.9%	52.7%
Sabbaticals	25.5%	6.8%



Glass-ceiling

Women are still under-represented in many IS positions, particularly in senior management



Job title **Percent of women in IS**

Management	16.7%
CIO/VP	26.7%
Director, systems development	26.7%
Director, networks	16.7%
Director, IS operations	16.7%

Networks	26.9%
Manager, voice and data communications	22.9%
Communications specialist	27.6%
Network administrator	26.7%
LAN manager	26.7%

Systems development	36.3%
Project manager, systems and programming	38.0%
Senior systems analyst	45.2%
Systems analyst	31.2%
Senior systems programmer	35.0%
Systems programmer	39.7%
Senior programmer/analyst	44.7%
Programmer/analyst	31.8%
Database manager	31.0%
Database analyst	42.2%
Data security administrator/analyst	

Technical services and operations	25.8%
Computer operations manager	33.9%
Computer operations supervisor	40.0%
Lead computer operator	40.9%
Computer operator	25.4%
Technical specialist	

PC end-user support	38.9%
Microcomputer, end-user computing manager	45.0%
Technical support manager/help desk manager	60.4%
Help desk operator	30.1%
PC technical support specialist	58.8%
Business services analyst	

Total percent of women in IS 37.3%

Percent of women in total U.S. workforce* 42.7%

How far have you come?

Two growth areas, networking and desktop computing, have seen some of the biggest IS salary increases in the past eight years



Title	Average salaries for select job titles			Compounded annual growth rate
	1987**	1991**	1996	
IS management				
CIO/VP	\$71,936	\$79,362	\$82,129	1.6%
Systems development				
Project manager	\$44,946	\$53,779	\$55,331	2.6%
Database manager	\$48,227	\$50,272	\$53,610	1.2%
Networking				
Communications specialist	\$35,346	\$38,333	\$44,588	3.1%
PC end-user support				
Microcomputer manager	\$37,333	\$46,397	\$47,543	3.1%

Sources: Computerworld 1995 Salary Survey; *Bureau of Labor Statistics, U.S. Department of Labor; **Computerworld 1987, 1991 Salary Surveys

Management: Special Report

COMPUTERWORLD'S 9th ANNUAL
SALARY \$ SURVEY

Cold Cash

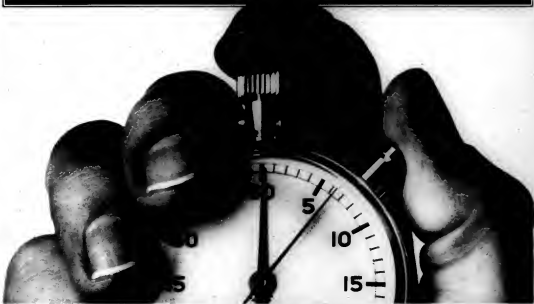
Of nearly 1,000 companies surveyed, 13.5% have IS department salary freezes in effect. And the bigger the company, the lower the likelihood of a salary freeze:

Large companies (revenues over \$500 million): 6.2%
Medium-size companies (revenues \$100 million to \$500 million): 8.5%
Small companies (revenues under \$100 million): 17.2%

TOP IS MANAGEMENT					NETWORKS			SYSTEMS DEVELOPMENT		
CEO/VP	Director, systems development	Director, networks	Director, IS operations	Manager of voice/data communications	Communications specialist	Network administrator	LAN manager	Project manager, systems and programming	Senior systems analyst	
Average \$67,129 Range \$9,439 Total \$91,568	Average \$67,276 Range \$6,706 Total \$72,982	Average \$65,110 Range \$4,940 Total \$70,050	Average \$60,196 Range \$5,179 Total \$65,375	Average \$57,139 Range \$3,139 Total \$60,278	Average \$44,568 Range \$2,386 Total \$46,974	Average \$41,240 Range \$1,640 Total \$42,880	Average \$44,175 Range \$2,627 Total \$46,802	Average \$55,331 Range \$3,055 Total \$58,386	Average \$60,368 Range \$1,522 Total \$61,890	
Bus. Sys. Mgr. \$146,590	Marketing \$98,400	Marketing \$94,983	Marketing \$91,380	Trans. \$80,600	Media \$83,687	Utils. \$48,590	Marketing \$94,376	Marketing \$72,706	Bus. Sys. Mgr. \$60,298	
Marketing \$118,973	Bus. Sys. Mgr. \$87,400	Bus. Sys. Mgr. \$79,500	Marketing \$79,375	Utils. \$86,000	Bus. Sys. Mgr. \$48,250	Marketing \$56,800	Bus. Sys. Mgr. \$71,200	Marketing \$69,813		
Media \$98,282	Utils. \$75,194	Utils. \$78,833	Media \$68,463	Utils. \$73,500	Marketing \$53,914	Marketing \$46,800	Bus. Sys. Mgr. \$68,600	Media \$62,125	Media \$58,143	
Insurance \$96,058	Insurance \$74,742	Insurance \$74,325	Total \$68,236	Bus. Sys. Mgr. \$72,000	Bus. Sys. Mgr. \$53,250	Networks \$45,836	Health \$46,694	Health \$40,800	Trans. \$53,350	
Health \$96,775	Media \$72,750	Media \$65,500	Insurance \$67,000	Insurance \$71,838	Distrib. \$51,000	Insurance \$44,870	Marketing \$46,714	Insurance \$69,117	Insurance \$52,685	
Bus. Sys. Mgr. \$90,861	Total \$71,225	Total \$64,200	Bus. Sys. Mgr. \$64,200	Marketing \$48,250	Networks \$46,250	Bus. Sys. Mgr. \$46,545	Bus. Sys. Mgr. \$67,214	Total \$62,823	Total \$52,823	
Health \$85,853	Trans. \$60,433	Health \$64,706	Utils. \$62,886	Media \$62,500	Insurance \$44,857	Govt. \$41,852	Utils. \$44,675	Total \$67,100	Health \$61,836	
Utils. \$86,234	Health \$68,311	Bus. Sys. Mgr. \$68,857	Trans. \$61,187	Networks \$60,700	Total \$44,450	Health \$41,200	Media \$43,000	Health \$55,469	Bus. Sys. Mgr. \$61,120	
Trans. \$86,591	Utils. \$60,000	Distrib. \$65,000	Govt. \$60,371	Marketing \$60,867	Trans. \$44,000	Health \$41,818	Trans. \$41,500	Networks \$63,833	Networks \$60,500	
Distrib. \$78,600	Distrib. \$60,818	Govt. \$54,941	Networks \$60,271	Govt. \$54,100	Health \$43,000	Total \$40,364	Distrib. \$41,375	Trans. \$63,620	Distrib. \$48,833	
Edus. \$73,784	Govt. \$58,838	Networks \$64,375	Distrib. \$59,293	Extel \$52,325	Govt. \$40,946	Trans. \$39,333	Health \$38,730	Trans. \$63,448	Govt. \$48,372	
Networks \$72,329	Networks \$68,900	Edus. \$64,267	Health \$57,617	Health \$51,864	Bus. Sys. Mgr. \$40,063	Media \$38,155	Total \$38,218	Govt. \$51,900	Total \$47,864	
Govt. \$68,440	Edus. \$67,867	Trans. \$63,650	Edus. \$53,230	Edus. \$47,187	Edus. \$38,154	Distrib. \$38,000	Govt. NA	Edus. \$50,176	Edus. \$48,132	
Computer Prod. \$136,700	Prod./Sys. \$98,776	Chemical \$118,500	Prod./Sys. \$94,967	Prod./Sys. \$72,000	Prod./Sys. \$68,380	Prod./Sys. \$61,583	Computer Prod. \$58,000	Insurance \$71,700	Computer Prod. \$61,000	
Prod./Sys. \$122,485	Computer Prod. \$86,278	Computer Prod. \$112,135	Chemical \$82,250	Computer Prod. \$72,700	Chemical \$61,250	Computer Prod. \$49,500	Computer Prod. \$68,000	Computer Prod. \$68,829	Prod./Sys. \$68,250	
Computer Prod. \$108,172	Prod./Sys. \$83,111	Prod./Sys. \$108,256	Computer Prod. \$81,375	Prod./Sys. \$70,600	Computer Prod. \$46,300	Computer Prod. \$44,200	Chemical \$82,600	Chemical \$68,829	Computer Prod. \$67,000	
Prod./Sys. \$108,836	Prod./Sys. \$79,500	Apparel/Health \$78,000	Computer Prod. \$82,086	Computer Prod. \$68,000	Prod./Sys. \$44,500	Chemical \$41,867	Prod./Sys. \$47,706	Prod./Sys. \$63,867	Prod./Sys. \$68,826	
Apparel/Health \$94,689	Prod./Sys. \$68,125	Prod./Sys. \$60,000	Chemical \$61,967	Prod./Sys. \$40,857	Prod./Sys. \$40,500	Computer Prod. \$40,543	Prod./Sys. \$44,867	Prod./Sys. \$62,714	Prod./Sys. \$64,000	
Chemical \$91,800	Prod./Sys. \$60,875	Prod./Sys. \$62,000	Prod./Sys. \$55,343	Apparel/Health \$54,867	Apparel/Health \$40,500	Prod./Sys. \$40,187	Prod./Sys. \$44,867	Prod./Sys. \$62,714	Prod./Sys. \$67,167	
Prod./Sys. \$79,564	Apparel/Health \$62,606	Prod./Sys. \$55,125	Apparel/Health \$53,500	Prod./Sys. \$51,250	Computer Prod. \$38,323	Prod./Sys. \$37,816	Apparel/Health \$41,812	Prod./Sys. \$62,887	Prod./Sys. \$48,900	
Prod./Sys. \$77,642	Prod./Sys. \$63,233	Computer Prod. NA	Prod./Sys. NA	Prod./Sys. NA	Prod./Sys. NA	Apparel/Health \$33,667	Prod./Sys. \$43,729	Apparel/Health \$62,583	Apparel/Health \$40,900	
Under \$100K: \$74,112 \$100K - \$200K: \$97,518 Over \$200K: \$131,639	Under \$100K: \$61,400 \$100K - \$200K: \$71,814 Over \$200K: \$93,526	Under \$100K: \$56,398 \$100K - \$200K: \$63,345 Over \$200K: \$80,721	Under \$100K: \$55,658 \$100K - \$200K: \$66,869 Over \$200K: \$84,682	Under \$100K: \$53,851 \$100K - \$200K: \$56,599 Over \$200K: \$69,157	Under \$100K: \$42,663 \$100K - \$200K: \$46,342 Over \$200K: \$51,635	Under \$100K: \$36,580 \$100K - \$200K: \$43,977 Over \$200K: \$47,401	Under \$100K: \$42,820 \$100K - \$200K: \$48,298 Over \$200K: \$50,715	Under \$100K: \$53,900 \$100K - \$200K: \$60,347 Over \$200K: \$62,896	Under \$100K: \$48,000 \$100K - \$200K: \$52,163 Over \$200K: \$66,765	

NA. Not available; respondent base too small to report findings

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Management: Special Report

COMPUTERWORLD'S 9th ANNUAL
SALARY \$ SURVEY

Golden Opportunities

On average, six industries pay their CIOs six-digit salaries: Food and Beverages, Consumer Products, Petroleum, Pharmaceuticals, Business Services IS and Finance/Banking. The lowest-paid CIOs are in Agriculture.

SYSTEMS DEVELOPMENT						TECHNICAL SERVICES OPERATIONS			
Systems analyst	Senior systems programmer	Systems programmer	Senior programmer/analyst	Programmer/analyst	Database manager	Database analyst	Data security administrator/analyst	Computer operations manager	Computer operations supervisor
Average: \$43,710 Bonus: \$1,706 Total: \$45,416	Average: \$48,635 Bonus: \$3,096 Total: \$51,731	Average: \$41,117 Bonus: \$770 Total: \$41,887	Average: \$44,263 Bonus: \$1,718 Total: \$45,981	Average: \$36,274 Bonus: \$829 Total: \$37,203	Average: \$53,610 Bonus: \$2,059 Total: \$55,669	Average: \$46,766 Bonus: \$1,908 Total: \$47,774	Average: \$46,170 Bonus: \$1,314 Total: \$47,484	Average: \$47,624 Bonus: \$1,821 Total: \$49,445	Average: \$38,167 Bonus: \$1,358 Total: \$39,525
Bus. Dev. \$49,000	Bus. Dev. \$47,000	Bus. Dev. \$33,625	Banking \$57,465	Banking \$46,147	Media \$79,5000	Banking \$55,000	Bus. Dev. \$51,500	Bus. Dev. \$42,500	Utils. \$50,250
Utils. \$48,250	Banking \$57,000	Banking \$49,150	Bus. Dev. \$49,800	Utils. \$43,271	Utils. \$76,500	Retail \$53,625	Insurance \$50,000	Insurance \$50,250	Trans. \$44,500
Trans. \$48,800	Media \$64,000	Utils. \$45,900	Health \$47,780	Bus. Dev. \$39,000	Utils. \$62,000	Insurance \$51,125	Retail \$48,200	Utils. \$57,267	Bus. Dev. \$43,000
Banking \$49,500	Health \$51,334	Nonprofit \$45,333	Trans. \$47,200	Trans. \$37,544	Banking \$49,900	Educ. \$50,500	Educ. \$47,750	Trans. \$51,067	Insurance \$39,000
Media \$44,067	Health \$50,867	Trans. \$49,000	Utils. \$46,577	Health \$37,500	Insurance \$59,763	Utils. \$48,250	Health \$49,000	Banking \$51,317	Media \$39,600
Insurance \$44,518	Trans. \$49,000	Retail \$44,875	Media \$45,214	Insurance \$37,872	Nonprofit \$54,000	Health \$47,871	Banking \$46,387	Health \$46,864	Health \$38,000
Govt. \$43,557	Insurance \$49,804	Media \$42,500	Bus. Dev. \$44,776	Health \$36,705	Govt. \$56,000	Govt. \$43,705	Insurance \$46,130	Media \$46,067	Banking \$33,417
Health \$43,314	Nonprofit \$49,750	Health \$41,825	Govt. \$43,796	Govt. \$36,819	Govt. \$52,430	Media \$43,500	Govt. \$45,273	Nonprofit \$48,429	Bus. Dev. \$36,250
Health \$43,871	Utils. \$49,800	Insurance \$49,800	Insurance \$43,117	Bus. Dev. \$35,792	Health \$52,425	Distrib. \$42,000	Bus. Dev. \$35,500	Health \$48,000	Nonprofit \$37,500
Retail \$42,417	Retail \$48,527	Health \$48,900	Distrib. \$42,429	Media \$34,847	Bus. Dev. \$51,500	Nonprofit \$42,750	Distrib. NA	Retail \$49,800	Govt. \$37,805
Bus. Dev. \$38,214	Bus. Dev. \$45,000	Govt. \$38,324	Retail \$42,000	Retail \$34,200	Educ. \$47,544	Trans. \$41,500	Media NA	Bus. Dev. \$44,300	Educ. \$37,636
Nonprofit \$38,000	Educ. \$42,964	Educ. \$34,364	Nonprofit \$40,650	Educ. \$32,796	Bus. Dev. \$46,846	Bus. Dev. \$46,500	Trans. NA	Govt. \$43,989	Retail \$37,805
Educ. \$37,833	Govt. NA	Bus. Dev. \$38,000	Educ. NA	Nonprofit \$32,400	Trans. \$43,000	Bus. Dev. \$38,333	Utils. NA	Educ. \$38,536	Health \$34,200
Consumer Prod. \$42,867	Chemical \$60,500	Consumer Prod. \$57,800	Consumer Prod. \$54,417	Consumer Prod. \$43,274	Food/Bev. \$72,750	Consumer Prod. \$61,000	Food/Bev. \$59,500	Consumer Prod. \$72,000	Chemical \$49,867
Met./Plas./Rubber \$56,800	Consumer Prod. \$56,867	Chemical \$44,000	Ind. Equip. \$53,000	Consumer Prod. \$42,750	Consumer Prod. \$68,375	Ind. Equip. \$53,000	Chemical \$60,800	Food/Bev. \$57,000	Food/Bev. \$44,800
Food/Bev. \$55,250	Ind. Equip. \$58,500	Food/Bev. \$43,000	Consumer Prod. \$55,234	Food/Bev. \$48,083	Consumer Prod. \$64,000	Food/Bev. \$54,333	Food/Bev. \$49,800	Ind. Equip. \$54,736	Apparel/Textile \$39,937
Chemical \$53,000	Consumer Prod. \$55,000	Permit Prod. \$42,333	Chemical \$49,000	Food/Bev. \$38,180	Chemical \$62,000	Consumer Prod. \$52,000	Met./Plas./Rubber \$46,000	Chemical \$53,750	Met./Plas./Rubber \$38,625
Consumer Prod. \$51,067	Food/Bev. \$49,000	Apparel/Textile \$41,867	Food/Bev. \$45,067	Chemical \$38,834	Chemical \$50,000	Chemical \$45,000	Consumer Prod. \$41,000	Consumer Prod. \$51,500	Chemical \$36,500
Permit Prod. \$43,333	Permit Prod. \$45,250	Consumer Prod. \$40,000	Permit Prod. \$44,188	Apparel/Textile \$37,883	Met./Plas./Rubber \$45,708	Apparel/Textile \$42,000	Apparel/Textile NA	Apparel/Textile \$51,425	Consumer Prod. \$37,500
Apparel/Textile \$39,333	Apparel/Textile \$42,333	Ind. Equip. \$39,867	Apparel/Textile \$44,000	Met./Plas./Rubber \$36,736	Permit Prod. \$43,625	Met./Plas./Rubber \$41,500	Consumer Prod. NA	Apparel/Textile \$47,321	Permit Prod. \$31,000
Ind. Equip. NA	Met./Plas./Rubber \$41,625	Met./Plas./Rubber \$37,767	Met./Plas./Rubber \$42,750	Ind. Equip. \$34,081	Ind. Equip. NA	Permit Prod. \$48,000	Ind. Equip. NA	Permit Prod. \$48,417	Ind. Equip. NA
Under \$30K \$40,806	Under \$30K \$48,514	Under \$30K \$36,898	Under \$30K \$43,589	Under \$30K \$35,304	Under \$30K \$46,365	Under \$30K \$41,490	Under \$30K \$43,625	Under \$30K \$44,662	Under \$30K \$37,306
\$30K - \$40K \$46,174	\$30K - \$40K \$50,358	\$30K - \$40K \$42,831	\$30K - \$40K \$46,278	\$30K - \$40K \$38,060	\$30K - \$40K \$56,069	\$30K - \$40K \$50,520	\$30K - \$40K \$50,730	\$30K - \$40K \$47,267	\$30K - \$40K \$36,500
Over \$40K \$50,144	Over \$40K \$54,877	Over \$40K \$45,500	Over \$40K \$48,160	Over \$40K \$39,932	Over \$40K \$61,062	Over \$40K \$49,628	Over \$40K \$48,834	Over \$40K \$59,517	Over \$40K \$44,180

NA: Not available; respondent base too small to report findings



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Management: Special Report

COMPUTERWORLD'S 9th ANNUAL
SALARY \$ SURVEY

Follow the Money
Companies in the Northeast were the most generous with raises: 51.5% of all raises were above 5%. The stingiest region was the Midwest, where 65% of all raises were 4% or lower.

TECHNICAL SERVICES OPERATIONS				PC END-USER SUPPORT			
Lead computer operator	Computer operator	Technical specialist	Microcomputer, end-user computing manager	Technical support manager/help desk manager	Help desk operator	PC technical support specialist	Business services analyst
Average: \$29,361 Bonus: \$943 Total: \$30,304	Average: \$24,681 Bonus: \$762 Total: \$25,383	Average: \$35,527 Bonus: \$874 Total: \$36,601	Average: \$47,543 Bonus: \$2,282 Total: \$49,825	Average: \$40,440 Bonus: \$1,318 Total: \$41,756	Average: \$28,940 Bonus: \$546 Total: \$29,486	Average: \$32,239 Bonus: \$806 Total: \$33,045	Average: \$36,569 Bonus: \$438 Total: \$37,205
Bus. Dev. \$33,390	Trains. \$30,875	Unk. \$46,825	Bus. Dev. \$51,000	Trains. \$53,350	Unk. \$36,187	Unk. \$46,825	Bus. Dev. \$49,800
Insurance \$32,979	Unk. \$27,900	Distrib. \$44,400	Media \$61,000	Trains. \$44,500	Bus. Dev. \$34,500	Building \$36,785	Unk. \$43,800
Media \$32,842	Govt. \$28,656	Insurance \$40,313	Insurance \$60,550	Bus. Dev. \$42,800	Trains. \$34,400	Trains. \$36,633	Building \$41,900
Bus. Dev. \$32,000	Insurance \$25,000	Media \$36,867	Unk. \$58,500	Health \$40,833	Building \$31,591	Nonprofit \$40,300	Media \$40,800
Govt. \$31,343	Media \$25,278	Bus. Dev. \$35,571	Trains. \$54,000	Govt. \$46,447	Distrib. \$31,250	Govt. \$33,804	Retail \$38,333
Unk. \$30,806	Educ. \$25,000	Health \$35,520	Distrib. \$40,333	Building \$38,250	Insurance \$30,000	Distrib. \$33,000	Bus. Dev. \$38,200
Health \$30,300	Health \$28,656	Nonprofit \$30,866	Govt. \$49,199	Media \$38,500	Insurance \$29,138	Insurance \$33,182	Health \$37,825
Building \$30,367	Nonprofit \$24,643	Educ. \$33,900	Health \$48,726	Retail \$37,190	Bus. Dev. \$28,750	Bus. Dev. \$32,567	Educ. \$36,643
Retail \$28,787	Distrib. \$24,559	Educ. \$32,960	Distrib. \$48,031	Nonprofit \$36,714	Nonprofit \$28,671	Bus. Dev. \$32,198	Nonprofit \$36,500
Trains. \$28,777	Building \$24,155	Trains. \$33,580	Educ. \$46,233	Educ. \$34,800	Govt. \$27,303	Health \$31,911	Insurance \$32,887
Retail \$28,539	Bus. Dev. \$23,750	Building \$32,573	Bus. Dev. \$43,067	Distrib. \$32,187	Educ. \$24,364	Retail \$30,778	Govt. \$29,836
Nonprofit \$28,367	Health \$23,463	Govt. \$31,396	Retail \$36,862	Unk. \$28,866	Health \$23,867	Educ. \$36,841	Distrib. \$28,866
Health \$28,295	Retail \$22,786	Bus. Dev. NA	Nonprofit \$35,100	Bus. Dev. NA	Retail \$22,857	Media \$27,571	Trains. NA
NA	NA	NA	NA	NA	NA	NA	NA
Computer Prod. \$24,000	Computer Prod. \$28,813	Computer Prod. \$40,000	Computer Prod. \$73,500	Computer Prod. \$56,250	Chemical \$33,667	Chemical \$41,000	Food/Vet. \$31,867
Food/Vet. \$26,333	Computer Prod. \$28,058	Computer Prod. \$41,641	Computer Prod. \$71,833	Computer Prod. \$52,000	Med./Pharm. \$31,125	Computer Prod. \$40,000	Computer Prod. \$39,000
Computer Prod. \$33,344	Food/Vet. \$27,858	Food/Vet. \$41,275	Chemical \$71,000	Computer Prod. \$48,000	Computer Prod. \$36,750	Computer Prod. \$36,750	Computer Prod. \$44,000
Chemical \$31,333	Computer Prod. \$25,000	Med./Pharm. \$36,740	Apparel \$49,333	Apparel \$48,000	Computer Prod. \$29,667	Computer Prod. \$36,750	Ind. Supply \$38,000
Computer Prod. \$30,000	Ind. Supply \$24,233	Computer Prod. \$37,187	Computer Prod. \$46,750	Chemical NA	Computer Prod. \$29,800	Food/Vet. \$28,357	Computer Prod. \$37,500
Med./Pharm. \$27,364	Med./Pharm. \$23,000	Ind. Supply \$24,733	Med./Pharm. \$46,000	Food/Vet. NA	Food/Vet. \$28,375	Apparel \$33,663	Computer Prod. \$38,000
Ind. Supply \$26,510	Apparel \$22,438	Apparel \$22,438	Ind. Supply \$44,400	Ind. Supply \$44,400	Apparel \$22,400	Ind. Supply \$31,857	Apparel \$31,857
Apparel \$26,040	Chemical NA	Chemical NA	Computer Prod. \$43,635	Med./Pharm. \$43,635	Ind. Supply NA	Ind. Supply NA	Med./Pharm. NA
Under \$100K: \$29,215 \$100K - \$200K: \$36,376 Over \$200K: \$32,448	Under \$100K: \$24,106 \$100K - \$200K: \$26,147 Over \$200K: \$27,161	Under \$100K: \$32,729 \$100K - \$200K: \$38,583 Over \$200K: \$40,865	Under \$100K: \$45,226 \$100K - \$200K: \$47,228 Over \$200K: \$50,309	Under \$100K: \$35,937 \$100K - \$200K: \$41,342 Over \$200K: \$49,877	Under \$100K: \$29,934 \$100K - \$200K: \$28,073 Over \$200K: \$30,561	Under \$100K: \$31,683 \$100K - \$200K: \$32,853 Over \$200K: \$36,499	Under \$100K: \$35,053 \$100K - \$200K: \$38,500 Over \$200K: \$39,510

NA, Not available; respondent has no email to report findings

METHODOLOGY

Computerworld, in cooperation with the Society for Information Management, conducted a nationwide survey of 15 employees to determine total compensation, salary increases, fringe benefits and turnover in the IT field. The mail survey was conducted in May and June 1986. A total of 987 responses were received.

About the respondents:

Average number of 15 employees:

Nonmanufacturing 118
Manufacturing 95

Average total number of employees:

Nonmanufacturing 2,964
Manufacturing 4,951

Estimated average of annual revenue or assets:

Nonmanufacturing \$499 million
Manufacturing \$699 million

Responses by industry:

Nonmanufacturing

Banking 6.3%
Business services (all) 1.0%
Business services (non-IT) 6.8%
Classification 7.6%
Education 7.6%
Government 10.8%
Health care 7.3%
Insurance 6.2%
Media 2.6%
Retail 4.8%
Nonprofit 4.1%
Transportation 2.8%
Utilities 3.7%
Total 72.4%

Manufacturing

Apparel and textile 1.5%
Chemical products 1.9%
Consumer electronics 2.3%
Consumer products 1.4%
Food, beverage and tobacco 3.9%
Forest products 1.7%
Industrial equipment 2.9%
Metal, plastic, rubber 8.4%
Other 7.8%
Total 27.6%

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Management

Calendar

SEPT. 25 - OCT. 30

MANAGEMENT

IACTIS '95, Toronto, Sept. 28-30—Theme: Information systems for the future. Contact: International Association for Computer Information Systems (IACTIS), Stillwater, Okla. (405) 744-3304.

The 1995 Computer Training and Support Conference, Orlando, Fla., Oct. 1-4—Sessions include: "Emerging Technologies: Looking in the Crystal Ball"; "The Next Wave: Technologies for the Mobile Professional"; "Software Licensing"; and "TAD, RAID and Software Development Methodologies." Keynote speakers: David Prentice,

president of Learning Corp., on "Super-Charged Customer Service: A Personal Statement of Excellence"; Sam Miller Hurst, director of the Starline Foundation, on "The Learning Edge"; and Elliot Masie, president of the Masie Center, on "Why Computer Users Say the Strangest Things." Fee: \$885. Contact: Soft Skills Institute, Medford, Mass. (617) 389-3344.

Re-engineering for Managers and Executives: Moving Benefits to the Bottom Line, Cambridge, Mass., Oct. 21-23—Topics include re-engineer-

ing overview, managing the process, change resistance, mobilization, designing case for action and re-engineering in practice. Contact: Kendall Institute, Inc., Scituate, Mass. (617) 544-3544.

TECHNOLOGY

1995 NASIRE Annual Conference, San Antonio, Sept. 29-27—Theme: "Pioneering the Information Republic: Meeting Citizens' Needs." Fees: \$295 for government employees, \$395 for National Association of State Information Resource Executives (NASIRE) members, \$605 for corporate nonmembers, \$100 for guests. Contact: NASIRE, Lexington, Ky. (606) 251-1900.

Armed Forces and Communications and Electronics Association, Dayton-Wright Chapter's 4th Annual Midwest Conference and Exposition, Fairfax, Va., Oct. 3-5—Theme: Information Technology in the 21st century. Conference is targeted at local military personnel, state and local government, office managers, systems managers, and more and industry executives. Free. Contact: J. Spang & Associates, Inc., Fairfax, Va. (703) 535-4563, ext. 6200.

Graph Expo, Chicago, Oct. 8-11—Focus is on technologies for the graphic communications industry. Topics include CD-ROM, on-line databases and direct digital and decentralized publishing through wide-area business networks. Contact: Graphical Arts Show Co., Kenosha, Wis. (708) 764-7299.

COMPUTERS

15th Annual Eastern America AT&T/IBM/MS Computer User Conference, Ithaca, N.Y., Oct. 18-20—Focus will be on Microsoft Corp.'s Windows NT, UNIX technologies plus general computer and management subjects. Contact: Frank Whalen, Thales Olsen Doring Machine Co., Willow Grove, Pa. (215) 675-7104, ext. 218.

TECHNOLOGY

Human Factors and Ergonomics Society's 39th Annual Meeting, San Diego, Oct. 9-13—Conference will feature more than 100 technical sessions on ergonomics, including design, prototyping, testing and evaluation, training and maintenance. Contact: Human Factors and Ergonomics Society, Santa Monica, Calif. (310) 304-2410.

The Mobile Outlook Exposition and Conference, Atlanta, Oct. 19-19—Topics will include mobile communications practices and potentials, field sales and service and wireless applications. Contact: Saadi Eberhard, Eberhard & Co., New York, N.Y. (212) 656-6186.

Calendar announcements should be submitted at least six weeks prior to the event and include the title of the event, dates, location, theme or focus, keynote or major speakers, principal topics and a contact person, organization and phone number.

David Whalen, Associate Editor/Management, Computerworld, 375 Convent Road, Franklinham, Mass. 01725. Fax: (508) 875-8931.

"Typically, when we had an important event coming up, we would rely on a mailing to our own database as the prime vehicle for getting the information to the people we had targeted."

This time, with our Enterprise Application Development & Executive Strategy Conference, we knew we had to have a marketing approach that would jump-start awareness for the conference and educate the audience on Hewlett-Packard's Enterprise Application Development Program. We really felt we needed to create our own publication. A piece tailored to deliver information of real value to the customer. That, if they're building a business-critical application, the best platforms for their development are the HP 9000 Workstations and Servers.

Another important consideration was using a publication with a very broad-based appeal in the information systems arena. That's Computerworld. We know, because we asked our customers.

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It worked very effectively in creating awareness of the conference and building preference for Hewlett-Packard programs."

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In Depth

THE PROJECT FROM HELL

**ONE PERSON'S
GUT-WRENCHING
TALE OF ANGUISH,
REBELLION AND
OUTRAGE. AND
WE'RE TALKING
ABOUT AN IS JOB
HERE.**

BY JEAN STANFORD

IT HAPPENED ONE DAY.

I thought I'd go in, do my job as an internal technology consultant and go home. Instead, I got involved with the Project from Hell.

My former boss, Joe, asked me to join a group of people analyzing the way my company was building software. Things had gotten out of hand on a \$500 million project. Even with staff working more than 80 hours a week, late deliveries and mismatched components were the norm.

Why me? Well, my department is part of the technical staff for corporate headquarters. We're supposed to help the divisions put in place best-of-breed practices for systems development. Joe also came to me because I wasn't part of his developer group. I didn't have a vested interest. I couldn't be fired or promoted by anyone I'd be auditing.

What follows is the true account of my travails trying to get to the bottom of our development problems. It's not a pretty story.

Project from Hell, page 82

Stanford is principal at Hostile Systems in Gaithersburg, Md. During the 18-month period of this "Project from Hell," from August 1993 to February 1995, she was internal consultant at a large systems development company in Maryland. She can be reached at jean1113@aol.com.



Project from Hell

PROJECT FROM HELL

CONTINUED FROM PAGE 81

Dear Diary



WHY IS IT EVERY TIME I ASK

about what's going on in software development, I hear sunny-day stories from a bunch of information systems managers who are used to fooling the HQ press? They'll tell me there are a few little glitches in the process, but those are under control, and everything is fine. I suppose I can't blame them; I've done that a few times myself. Joe's got 25 years of experience in IS, and I trust his intuition that something's terribly wrong. How can I find out what's really going on?

WENT TO SEE JOE. THIS

project is huge! We're talking a real-time technical application worth more than \$500 million. It has hundreds of programmers writing hundreds of thousands of lines of code in several languages, such as Ada and C, for multiple platforms, including Unix, VM, MVS and DOS. The project's cost-justification included building in code reuse, so I know the software development process will be complicated beyond anything I've ever seen.

I'm really worried. There are too many players and processes for me to assess on my own. It's going to take weeks just to learn the org chart. Besides, lots of these folks don't even work for Joe, so they'll welcome me like a visitor from the IRS.

I just read a cool book called *The Windows of Thomas* by Joe R. Katzenbach and Douglas K. Smith (Harvard Business School Press, 1983) about how to form multidisciplinary teams. I'd like to form such a team to do the audit. The idea is to gather a bunch of techies who are actually doing the work and ask them how the thing is going. But it would be revealing — certainly more revealing than talking to project managers who bring me their blue-sky charts and tell me how things are supposed to work.

By forming a team of low-level technical staff from the various IS groups, I can find out what the critical issues are at the grassroots level.

et. Then I can convert what we find out into higher-level process recommendations.

JOE WAS A BIT TAKEN ABACK

this morning when I offered up the idea of using teams. It made him nervous because, after all, for the past 25 years he's only talked to managers about how things were going. Getting the scoop from the trenches isn't the traditional way to do an audit — and Joe is the most traditional of men. But after a while, he warmed up to the idea (I guess when you're desperate, you do unusual things). Later in the afternoon we went around to the user department managers to recruit nominees for our audit team.

WELL, THE SOFTWARE

development managers hated the idea. They told us to expect dead (pretty much what I expected).

The development managers say they aren't interested in creating more work for their overburdened staffs. Everyone already has worked incredible overtime on this project. The customer keeps changing requirements. Get this: It now wants to move pieces of the project from a mainframe to a client/server platform.

Joe and I tried to convince our developers that if we smooth out the process, it will mean less work in the long run.

At least Joe's on my side.

I CAN'T BELIEVE IT, BUT I'M

finding some pockets of support. One systems engineer is going to join the audit team because her manager wants to know what we're up to — kind of like having a spy in our midst.

Three people are coming from the test group. These guys are all for the idea because they're getting hurt by the shape of the software they're getting to test. The manager of the test department told me in no uncertain terms that the software devel-

opers better get their act together.

The rest of the team is coming from the technical staff of the build department and the systems configuration management (CM) department. The CM guys deal with the overall structure of the system such as hardware components and specifications. Specs have been changing so rapidly, they want to get a handle on what is coming at them. The software guys keep saying, "Trust us. We're working as hard as we can. We'll explain things when we're done." Which, of course, never happens.

There are 20 people on the team.

WE'VE JUST HAD OUR SECOND

two-hour meeting. I thought we would all work together to do a top-down map of how the process works. Then we could analyze the process and make it more efficient.

Not on your life. These guys don't want to spend time doing a process map — even though that's what all the process improvement books say to do. They say they're too busy, and they don't care about the overall process anyway. Now what?

TODAY'S MEETING WAS

a little better. The data dictionary support group, which is responsible for standardizing data elements across the application, walked through its process for handling bug reports.

The presentation generated a lot of discussion. People actually said they had a better tool for the issues in handling the data dictionary and a little more sympathy for the poor guys trying to manage the big beast. We agreed to meet for two hours next week to discuss how bug reports are managed in the test tools department.

WE GOT INTO THE BUG-FIXING

process for reused code today. What

a rat's nest! If the programmers don't have a way to record exactly which bug they fixed where they check in the code, we can't tell if the reused code is up to date or not.

We got into this area because of a "hot button." One of the guys had spent all weekend testing something that turned out to have a bug that others had known about.

Programmers are reusing code that isn't quite ready for prime time. They are just copying source code and making their own changes to those copies. So when someone finds a bug in Copy A, he has to notify the people who have Copy B and make sure they make the fix. Multiply that by hundreds of reused files, and you have — well, you have a mess. You also have a lot of coordinating to do. The source code management process needs to be spiffed up.

If we get a better source code management tool and get the software developers to use it, it will save a lot of time. Instead of calling each person you think might have copied the code, we could put a public notice on our Unix-based groupware software that something had been checked in with a certain bug fix. Then everyone who needed the fix could copy the file.

WE SPOKE WITH SOME

programmers about checking in the files each time they make a change and recording the bug report number. Get this: That's already what they're supposed to do, but they've been circumventing the whole bug report process. They proudly demonstrated a clever tool they had written that faked out the central repository and let them avoid checking for bugs with each change.

They were supposed to be checking in files as they completed each change. Instead, they kept all their working files in their home directories. Once every three months, their

Project from Hell, page 84

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PROJECT FROM HELL

CONTINUED FROM PAGE 82

ingenious little tool swept their directories and checked everything on mass for the whole subsystem. If that wiped out some files, well, tough. They met their schedules, and that's all that mattered because that's what they were measured on. No wonder the test schedule is trashed. The test guys are getting a totally unstable system every time. The testers are ready to bomb the lab, and I can hardly blame them.

IT'S TIME TO TELL IS

management what we've found — that the change control processes (such as bug reporting) need a lot of work, the software build process is out of control (surprise) and that they will miss customer delivery dates if there aren't changes. We're not talking about missing dates by months but by five years or more — no joke. We need process fixes, new people and organizational structure as soon as possible.

This isn't going to be a happy meeting. I'll do the briefings because I'm from IS, and they can't fire me. None of the people on my team want to come. I don't blame them.

THE MANAGERS THANKED ME

for my report and said they would handle it from here. Why do I think it fell in the bit bucket? I gave a copy of the report to my manager, just in case.

A MONTH HAS GONE BY. MY

friends tell me the process is as screwed up as ever. My manager is going to mention it at the next program review. But he'll get more of the same IS management show biz.

IT ALL HIT THE FAN TODAY.

The last delivery fell completely apart. The subsystems that had worked together before the release suddenly didn't talk to one another. Reports were wrong. Functions that worked before were now broken. And systems performance degraded, too. (Click on an icon and you could go out and get a cup of coffee while you waited for a response). Worse yet, the customer's test people were in the lab to see it. Talk about irate! Uh, oh.

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Project from Hell

MY BUG REPORT PROCESS MAPS

are coming in handy. I've been appointed to an emergency team to fix the process so the customer remains some confidence. Funny, this time the software people are working with us.

THERE HAVE BEEN A LOT

of changes in the past six months based on our team's suggestions. A new person is in place — her official title is Config-

uration Management Process Owner — who will be responsible for every aspect of configuration, from requirements tracking to hardware and operating system configuration to the actual configuration of each release and delivery. This is the first time we've had someone in charge of the development picture from end to end.

There was a lot of moaning and groaning, but now IS nudges every step, and developers have to check in code for each

bug report change made. To everyone's surprise, overtime has gone down. Working with a more stable base is making everyone's job easier. The software installs better, and it is running more predictably.

I CAN'T BELIEVE I'M WRITING

this, but I'm off to do another audit in which I'll apply the same techniques. Into the next fire!

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UP-AND-COMER

Data steward

In the quest for high-quality, available data, more companies are recognizing this critical role

By Claudia Inhoff

The word steward may mean "keeper of the city" in Old English, but don't let the description fool you. Experts who can manage corporate data are fast becoming a hot commodity.

The explosive growth of data warehousing and sophisticated access tools proves that data is one of the most critical corporate assets. But data warehouses are only as good as the data that goes into them.

Problems occur when information is moved into these pools of historical data, making integration and synchronization of legacy data imperative. At a growing number of companies, this task falls into the hands of the data steward.

Data stewards manage data assets to improve reusability, accessibility and quality. And they do anything from approving data naming standards and developing consistent data definitions to documenting business rules. The result is a unification of corporate data (see Table 1).

Such an integrated view provides

the foundation for the shared data that is so critical in data warehouses. Moreover, the data about data (also known as metadata) is used by knowledge workers to determine whether correct comparisons have been made and proper trends have been created.

But what are good data stewards made of? Technical skills are critical, but the often overlooked interpersonal skills are equally important. For example, the job needs someone whose business knowledge is well respected and who can assure the different user communities that they can create metadata and business rules that are easy to implement and maintain. They must also be able to facilitate agreements among groups and reach a consensus when possible (see Table 2).

Optimum conditions

A typical corporate data stewardship should have one data steward assigned to each major data subject area.

Each steward works with a group of peers responsible for resolving data integration issues in its subject area. The results are then passed on to data and database administrators and implemented into the corporate data models, metadata repository and data warehouse construct.

Just as there is a data architect in

most data administration functions, there also should be a lead data steward who determines and controls the domain of each steward. Domains can become muddy and unclear, especially where subject areas intersect.

So where do good data stewards come from? Data modelers who have worked in data administration typically make good data stewards. They understand the technical issues of data integration and are usually exposed to the business community while modeling the business rules, data entities and attributes. And generally they have good rapport with users and database administrators.

Subject matter experts from the user community also make good data stewards, but some technical understanding of the data models and systems and familiarity with other business areas are important.

In most cases, there's little overlap of responsibilities of data stewards, data administrators and database administrators, but there must be a great deal of collaboration and communication among them to ensure that data assets are used effectively (see Table 3).

Of the three, data stewards probably have the highest profiles. They act as conduits between information systems and users and must guarantee that a company's data is used to its fullest capacity.

For data stewards, the future holds a great deal of promise.

Inhoff is a founder of Intelligent Solutions, Inc. in Boulder, Colo., a data management consulting firm that specializes in design and implementation of data warehouses and operational data stores.

Table 1

Data stewards are responsible for the following data integration issues:

- Naming standards • Standard entity and relationship definitions • Business rules specification • Standard calculation and transformation definitions • Entity and attribute aliases • Data quality and retention criteria • Data archiving for the data warehouse • Data security specification

Table 2

Steward skills

- Basic understanding of data modeling (conceptual, logical and physical) • Basic understanding of Databases • Basic understanding of data warehouse concepts • Facilitation skills • Technical writing

Interpersonal skills:

- Solid understanding of the business • Communication skills • Openness • Creativity • Diplomacy • Team player • Well respected in their subject area

Table 3

Role relationships

- Data stewards:
 - Resolve data integration issues • Determine data security • Document data definitions, calculations, transformation rules and so on • Maintain/update business rules
- Data administrators:
 - Translate findings of data stewards into data models • Maintain conceptual, logical and physical data models • Assist in data integration resolution • Maintain metadata repository
- Database administrators:
 - Generate physical database schema • Perform database tuning • Create database backups • Plan for database capacity

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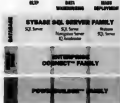
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- BPCS - 2+ years experience (distribution and financials experience)
- Software 2000 - 2+ years experience (financials and HR)
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Cardinal Health, Inc.

AS/400

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Computer Careers Midwest

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- C/2/P
- RISC Systems (MIPS, SPARC)

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- Applications Programming (DB2, RISC, C/2/P, SPARC)
- Software Writing/Documentation
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- Customer Service

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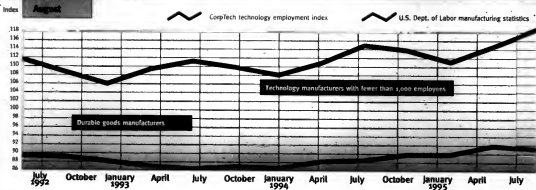
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Marketplace

REBELS without a CLUE

Worried about renegade users storming your departmental LANs with Windows 95? Just line 'em up and shoot 'em, one expert says.

By Leslie Goff

Has the desktop revolution come, full circle? New shots are being fired in the distance, new lines are being drawn in the sand, and the powers that be are issuing new ultimatums meant to dissuade the rumbling masses.

Experts are devising strategies to forestall users who demand they be upgraded to Microsoft Corp.'s Windows 95 before the year is out. Their battle plans may leave some users feeling like the Confederate Army after General William Sherman firestormed Atlanta.

"The first thing you do," says Jack Gold, program director at Meta Group, Inc.'s Workgroup Computing Strategies service in Stamford, Conn., "is designate a wall in the building that you don't mind being riddled with bullets, and then you take these people out and shoot them, one at a time."

Joe Schwartz's solution is less severe: "Fire them," says the consultant software engineer at a major New York financial institution.

Unfortunately, both concede, neither solution is available to most information systems departments.

A more moderate approach is to "give them just enough rope to hang themselves," says Ken Burrows, manager of end-user services at Roseville Telephone Co. in Roseville, Calif. "The way we handle it is really simple: If you open the box, you void the warranty. If they load it, they'll have problems. We won't support them, and they'll just hang there until

their manager calls us and asks us to set their PC back up."

Burrows notes that his department can't afford to run things any other way. Roseville's wide-area network is a "quirky mix" of hardware platforms and operating systems that can't easily handle deviations from the company's standard desktop configuration.

"We have so many different operating environments interconnected that it takes almost nothing to knock the network off course," he explains. "So that's basically a fear that keeps people in line, because they don't want to get thrown off the network."

For their own good

Like Burrows, Gold also subscribes to the "tough love" theory. "When they want to know why they can't have this new interface at work, you have to tell them, 'Because I said so,' like dealing

with your kids," Gold says.

"If you buy a GM car and put a Ford engine in it, neither company is going to service it," he adds. "Being on their own for support is a really huge disincentive to users."

Laying down the law is one thing, but enforcing it is another. No matter what deterrents are in place, some users will sneak and load their precious new operating system with its breakthrough graphical user interface. Because they use it on their home PCs and corporate laptops, they will feel empowered to defy you faster than you can say, "Steve Jobs." They will see themselves as the new liberators of corporate IS autonomy.

So you may as well be ready for it or you could end up feeling like the Confederate Army while your users enjoy the spoils of victory.

"This denial that people are confronting must be broken," says Schwartz, an avid Windows 95 beta user. "It's time to move from denial to acceptance and study the effects of [Windows] 95 on workflow, applications and training. Ultimately, the decision to move to [Windows] 95 will be driven by the state of the hardware platform on your users' desks, but they will all want that interface at work within days of having used it [elsewhere]."

The key to the next few months is maintaining organizational stability, says Robert Spicer, chief information officer/executive vice president of IS at Chevy Chase Bank in Chevy Chase, Md., and an OS/2 enthusiast. Enlist managers to help convey to your users that the move to any new operating system must

be managed cautiously, he says.

"To have a single user decide on his own to upgrade their operating system puts the organization at risk. And if you have lots of users doing that, the organization will be at great risk," Spicer says. "So get other managers involved. There needs to be a companywide audit function that looks at the risk, a training department looking at those issues and so forth. This is a risk/benefit decision, not an IS decision, so don't stand alone."

The author of a book on change management sees more than a little irony in the debut of Windows 95. "Instead of trying to move users to a new technology, IS is trying to moderate the demand," says Barbara Bouldin, vice president of research and development at Softworks, Inc. in Alexandria, Va.

"But I don't think you can stop it," she says of users' overwhelming enthusiasm for the operating system. "IS managers are on a wild horse here, and they either have to ride it or get thrown off. I remember at AT&T in the early '80s when one of my colleagues was starting to get into micros, and our director went bananas. He was saying, 'These are out of control; they're toys.' We just told him, 'People are going to be using these things, so we can get on this wagon and ride along or get left in the dust.' And we have the same thing here."

Goff is a freelance writer in New York



"Because I said so"

Some experts subscribe to the "tough love" theory when it comes to stalling users on a Windows 95 rollout. "When they want to know why they can't have this new interface at work, you have to tell them, 'Because I said so,' like dealing with your kids."

—Jack Gold, Meta Group, Inc., Stamford, Conn.

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M A G

Mergers

CONTINUED FROM COVER 1

week. And having the social and political skills to bridge the gap between the information systems and business units won't hurt.

"We need more [information technology] personnel who can effectively consult, communicate and strategize with our internal business customers," said Austin Adams, executive vice president of automation and operations at First Union Corp. in Charlotte, N.C. Like so many of its brethren, the bank is in the process of acquiring another bank — in this case, a \$5 billion deal to buy First Fidelity Bancorp.

The Chemical/Chase deal is expected to result in 12,000 job cuts, 160 branch closings and \$1.5 billion in annual cost savings after three years, according to executives at both banks.



Source: Deloitte & Touche, New York

Yet most of the employees being displaced through profit-driven mergers are tellers and clerical staffers. Technical staff jobs are more secure because IS professionals are needed to smooth the systems consolidations that result.

Indeed, bank IS staffing levels are expected to remain stable at 0% of total bank employment through 1997, according to The Power Group, a Wellesley, Mass., banking and technology consultancy.



But these consolidated banks won't need a surplus of Cobol programmers. Rather, the banks will be looking for highly skilled analysts — even theorists — who can provide the technical advice needed to select and integrate advanced technologies such as those supporting on-line banking, said Frank Woolsey, national director of financial service consulting at Deloitte & Touche.

The demand for IS banking professionals with client/server, C++ and Visual Basic programming skills "is growing like crazy," according to Roy S. Sanders, president of Sanders Management Associates, Inc., a Parsippany, N.J., consultancy and outplacement firm.

While IS spending in the U.S. banking industry is growing at about 8% annually, the shift toward data center consolidation and outsourcing is "removing a lot of traditional [IS] jobs," said Laura Stuart, president of Stuart Research, a banking consultancy in Cambridge, Mass.

Even though they will continue using legacy systems into the next millennium, most of the high money center banks are trying desperately

to play catch-up with brokerages and mutual funds companies. In the past 10 years, these competitors have usurped the clientele of traditional banks through the savvy use of distributed technologies.

"Banks have come to the conclusion that brick-and-mortar [branches] are not the distribution channel we can continue to emphasize," said Rick Sellers, president of Huntington Service Co., the operations and technology arm for Huntington Bancshares, Inc., both in Columbus, Ohio.

A recent survey of 924 U.S. businesses showed that banks lagged behind stock brokerages and mutual funds companies in implementing client/server computing.

The survey by International Data Corp. in Framingham, Mass., found that only 56% of banks said they were moving to client/server, compared with 57% among other financial service providers.

Q Citicorp, BankAmerica and other banks are developing a way in send checks over the internet. See page 57.

Keeping in step

It's no secret that IS professionals with C++ and object-oriented programming skills are in big demand in banking and other vertical industries these days.

But for IS organizations bent on retraining their existing staffers in cutting-edge technologies, the tricky part is determining who has the required technical and social skills to adapt to today's team-oriented, distributed landscapes.

That's just what First Chicago Corp. in Chicago is trying to accomplish as it nears the completion of a 6-month-old pilot involving 80 of its 650 IS staffers. The bank, with \$78.3 billion in assets, decided to launch the retraining program as an option for its IS veterans.

"Our goal is to keep our people employable by keeping their skills fresh," said Donald R. Holts, executive vice president of IS at First Chicago.

Because First Chicago plans to use its legacy systems through the end of the millennium and beyond, the bank will continue to need IS professionals with traditional skills. Half of the pilot participants have traditional legacy systems skills, while the others have already been retrained to support newer distributed technologies.

Staffers updated on the technologies are likewise being assessed to ensure their skills correspond with the bank's needs, said Jeremy Farmer, First Chicago's senior vice president of human resources.

To help IS professionals determine what career paths are best suited for them, First Chicago employed two methodologies during its pilot program. The first was a Windows-based package called Skills Asset Management System from People Sciences, Inc. in Maplewood, N.J. The package was designed to analyze employee skills gaps in various formats.

The other model — the Cambridge Assessment Method from The Cambridge Assessment Center, Inc. in Cambridge, Mass. — is a self-examination software tool kit that measures soft skill traits. "We believe that in the new technology environment, there's a greater need for soft skills than those required in the traditional [legacy systems] world," Farmer explained.

First Chicago will share the results of the pilot with IS employees at its technology seminar for bank employees later this month. — Thomas Hoffman



First Chicago's Donald R. Holts IS benefits from retraining program for veteran staff

Win 95, NT reality

CONTINUED FROM COVER 1

patibility between the two operating systems could be costly for mixed NT and Windows 95 shops, whether they are developing in-house or commercial applications. Tracking and updating two sets of applications is a greater administrative headache than dealing with fully compatible applications.

"Our answer to this right now is not to stop using Windows 95, only in NT," said John Gray, technical services supervisor at United Parcel Service, Inc.'s Air Group in Louisville, Ky. The company recently

chose NT as its primary corporate application development platform, with Windows 95 on the desktop.

"But we don't know what we're going to do beyond that. We'll likely wait for the Explorer Shell," Gray said. "But there will be people who can't wait, who need to get going right now. They will have to live with the fact that they'll have two versions."

Kenneth Lassenen, a developer and technology engineer for The Microsoft Network, acknowledged that "to get the Windows 95 user interface for all versions of NT, you have to wait until one of the next versions — NT 3.52 or NT 4.0 — is released."

Microsoft posted a technology preview

in July of the Explorer Shell on CompuServe and The Microsoft Network so that developers could begin Windows 95-compatible application testing on NT, said Megan Bliss, Microsoft NT group product manager. But the posted shell release has significant bugs and lacks support, Lassenen said.

Developers who must write separate applications for NT and Windows 95 are looking for Microsoft to close the timing gap between the release of Windows 95 and its user interface for NT. "If you write a Windows 95 application that uses the [Explorer] shell extensions, it won't run on NT until Microsoft releases the Windows 95 shell for NT," said Carl Beame, chief technologist at Beame & Whiteside,

a subsidiary of Hummingbird Communications Ltd. in Toronto.

Beame uses Windows 95 beta testers who are writing applications for both NT and Windows 95. "What Microsoft is saying is after one of the next versions of NT, then things will work," he said. "But when's that going to be? How about now?"

Commercial application developers could be forced to issue a disclaimer such as "Only runs on NT 3.51" until Microsoft releases the updates that create application compatibility between the two operating systems.

But Bliss said, "There may be a gap between the two because of the difference of ship dates, but we try to keep the gap as small as possible."

The Back Page

MVS earns mantle of most bulletproof system

User impressions of operating systems mainly are based on the year on the wrapper: IS managers peer beneath the packaging and inquire about the system's vital character. IS managers ignore the bold colors on the box and look at the system code, demanding that it show a high degree of reliability and survivability. In other words, they want plain, old uninterrupted uptime.

They know Unix made great strides between System V Release 3.0 and Release 4.0, in which it gained the ability to gently bring down a failing system and recover. But the standard by which all others are judged is IBM's MVS, an operating system whose inner nature remains beyond the ken of the masses pushing through the doors of superstores at midnight.

If we're talking uptime, then Windows must have the decency to take its place at the back of the line. With Windows, reliability falls more under the heading of whimsy than necessity. And Windows, prior to Version 3.0, represented an all-time low in operating system performance despite its sales.

In computer systems, disk drives fail or CPU hardware faults occur. In the software on those systems, programming errors inevitably occur and the unre-

dictable happens. At that stage, how the operating system reacts becomes crucial.

MVS constantly monitors all elements of the system, watching for CPU or disk drive faults, applications spiraling into infinite loops or programming errors that can grind an application to a halt. When it finds something wrong, it rips off the problem and keeps the rest of the system running.

Design coup

It was a design team with MVS back in the early 1970s "to isolate an error to the smallest possible unit of work and shed that work," recalls Fred DeWald, vice president of software development for IBM System/380 in Poughkeepsie, N.Y.

Programming errors are "fenced off" where they originate, and the main process keeps running. A transaction gets abandoned, but the subsystem, such as CICS, continues putting through other transactions. If the error is serious enough, the subsystem is brought down, but other subsystems are protected and remain up and running.

If a logic error in an application destroys its own data or instructions, "we will carve it out of the system and terminate it," DeWald says.

Recoverability is the second phase of MVS's uptime credo. It can recreate those

wands of user keystrokes in a recovery phase. Its extensive journaling and diagnostic capabilities allow it to capture system images as systems operators or automated utilities can spot exceptions and causes of problems. Utilities such as systems resource manager, workload managers and job schedulers give IS managers the ability to prioritize subsystems and keep the vital ones running at all costs.

An advanced version of Unix, such as Sun's Solaris 2.4, now has journaling and recoverability features, but company spokesmen acknowledge that they are followers of MVS in this area.

These capabilities don't come without a price. MVS is known for its size and overhead in querying its own operations. It's said that in the dead of night, when batch jobs are exhausted and no users are on-line, MVS uses up 20% of system resources talking to itself.

Part of its bulk stems from the need to keep large blocks of recovery code ready to back out of failed processes or trans-

actions and restart them. And when it encounters a failure from which it can't recover, such as the demise of a CPU, MVS halts the application that was running

and moves it to another tightly coupled processor.

To users, an operating system is a faceless copilot along for the ride, while the application events out the real work. IS managers know better. They know that the operating system better have an unflappable character and ingrained experience reacting appropriately to trouble, lest everything be lost in a crash.

MVS monitors system operations, willing to seize the controls at an instant's notice. And once in control, years of experience diagnosing the pressure points come to bear. Odds are high that any threat to the overall system will be jettisoned, and MVS will complete another day of continuous uptime.

Babcock is Computerworld's technical editor. His Internet address is charles_babcock@cw.com.



Charles Babcock

Inside Lines

Dying the CEO coffin

The identity of the new Chase Manhattan Corp., the result of a merger between Chemical Banking and Chase National Bank, political Chemical City Information Officer David O'Leary is not technology himself. He values time that leaves room for Chase City's Chief Executive Officer. Sources at Chase say Goldman is expected to take on a similar role at Prudential Securities in Newark, N.J., where he would join former Chase N.Y. chief and Prudential Arthur Rosen, who last year became Prudential's chairman and chief executive officer.

Pioneers

Sparks are expected to fly at next week's last meeting of the Illinois gas group in Chicago. A second-off session with IBM executives will give customers a chance to vent concerns that afflicted Version 2. Release 1 of the OS/2 operating system earlier this year. While the big problems appear to have largely been corrected, some users are still waiting over the mailbox for a fix. IBM industry observers predict that OS/2 is in for a "seasoned" launch.

Sector is a shaker

Best MicroStrategy Analyst 43 compensating utility for Microsoft's Windows 95 going away. I'd rather review it as a tool for the business. Some users are happy that the upgrade doesn't mean Windows 95 is being the same as earlier versions. Some users are happy that there are good things about it. Windows 95 has a 32-bit driver, which means it can support a 32-bit system to revert to 16-bit mode. That means a 32-bit system can run on a 16-bit system. That means a 32-bit system can run on a 16-bit system. That means a 32-bit system can run on a 16-bit system.

as really a full 32-bit conversion. A first system upgrade. He says the "business decision" hasn't been made. It all depends on whether the move toward 32-bit hard disks on new PCs creates more of the disk compression market.

TI finds the low road

Texas Instruments is preparing a new line of portable computers it will announce next week. Paved the way to the market, as a number of highly innovative but relatively high-priced notebook computers. The latest offerings will come in at a very challenging \$1,700, according to a source close to the company. The line will be based on Intel's Pentium processor and feature a highly integrated and modular design that will let users swap CD-ROM drives, floppy drives and batteries into battery packs through a front-loading slot. Notebooks from Windows 95 and Windows 95 are also expected to be part of the new line. Sources say the Pentium-based line will serve to highlight and replace the TI's own series and ship by November.

Worried? No?

IBM is getting ready to launch a line of Agave consumer PCs later this month. The PCs will be based on Pentium chips and combine a host of multimedia and communication features expected to find their way into conventional IBM PCs early next year. The Agave will come with full-motion, full-screen video and integrated audio. These features are expected by IBM's approach to the PC market. IBM is the main PC. As through the PC market, IBM will support the world's Windows 95, which is the main PC. IBM is the main PC. IBM is the main PC. IBM is the main PC.

Microsoft gets SAPpy

Microsoft and SAP AG announced this week to jointly announce Microsoft SQL Server supports for SAP's R/3 client-server enterprise software suite. Early adoption of this configuration are said to include Midland-Placid, a major oil and gas company. The client-server R/3 server 4.0, shipped in late June, includes database replication, Microsoft's standard database and administration tools.

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